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L23	proxy with bidd$	180	L23

L22	l21 and (auction near behavior or bidd$ near behavior)	0	L22
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L20	L19 and (auction near behavior or bidd$ near behavior)	0	L20
L19	5839114.pn.	2	L19
L18	L17 and (auction near behavior or bidd$ near behavior)	0	L18
L17	5835896.pn.	2	L17
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L6	(auction with behavior or auction near behavior or auction adj behavior or bidd$ near behavior or bidd$ adj behavior or bidd$ with behavior)	168	L6
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L1	(auction with behavior or auction near behavior or auction adj behavior)	130	L1

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L1: Entry 116 of 130 File: USPT Apr 25, 2000

DOCUMENT-IDENTIFIER: US 6055518 A
TITLE: Secure auction systems

Brief Summary Text (11):
The secure auction system of the present invention provides an interface or bidding terminals by which clients or bidders can issue secret bids to the auction servers for an advertised auction. Once the bidding period is closed, the auction service opens the bids, determines the winning bid, and provides the winning bidder with a ticket for claiming the item bid upon. Using novel cryptographic techniques, the secure auction system is constructed to provide strong protection for both the auction house and correct bidders, despite the malicious behavior of any number of bidders and fewer than one-third of the servers comprising the secired auction system. Specifically, it is guaranteed that (i) bids of correct bidders are not revealed until after the bidding period has ended, (ii) the auction house collects payment for the winning bid, (iii) losing bidders forfeit no money, and (iv) only the winning bidder can collect the item.

Detailed Description Text (6):
There are numerous possibilities for corruption and misbehavior in the sealed-bid auction. Possibly the most difficult to counter are those that involve the misbehavior of insiders in charge of executing and overseeing auction server group 110 (e.g., employees of the auction house), especially when this behavior involves collaboration with certain bidders at bidding terminals B.sub.1, B.sub.2, B.sub.3 and B.sub.n. Below are several examples of behavior that could yield an improper auction, many of which may be very feasible in a naive electronic implementation of auctions: (1) Prior to the close of the bidding period, an insider having access to server group opens submitted bids and informs a collaborator of their amounts so the collaborator at one of bidding terminals B.sub.1, B.sub.2, B.sub.3 and B.sub.n can submit a bid for the minimum amount needed to win the auction; (2) an insider in control of server group manipulates the closing time of the bidding period. For example, the insider attempts to prematurely close the bidding period in an effort to exclude some bids; (3) bids for one auction are diverted to a second auction with an earlier closing time, causing their amounts to be revealed prematurely to an insider at server group ; (4) after the close of the bidding period, a bidder at one of bidding terminals B.sub.1, B.sub.2, B.sub.3 and B.sub.n arranges to withdraw a bid or insert a bid, in collaboration with an insider at server group ; (5) an insider having control of server group awards the auction item to someone other than the winning bidder (and goes undetected because bids are not made public); (6) an insider at server group collects payment from losing bidders (e.g., by informing each that it won), or collects payment from the winning bidder but fails to provide the means for that bidder to obtain the item bid upon; and (7) the winning bidder refuses to pay the auction house (e.g., by disclaiming the bid or claiming that it lacks sufficient funds).

Detailed Description Text (8):
Secure auction system 100 of the present invention prevents the above behaviors and most other "attacks" on auctions, despite the malicious behavior of arbitrarily many bidders and fewer than one-third of the auction servers comprising the service. We would find a process (bidder, server, etc.) to be correct if the process always follows the specified protocols. We describe the properties provided

by secure auction system 100 in two categories, namely Validity properties and Secrecy properties.

Detailed Description Text (68):
The preferred embodiment of the present invention provides the design and implementation of a practical distributed auction service that can tolerate the malicious behavior of fewer than one-third of its servers and any number of bidders. Our design of auction system 100 is based on several cryptographic primitives, both old (multicast, secret sharing, digital cash) and new (verifiable signature sharing). The implementation of this service suggests that this approach performs sufficiently well to be useful in a wide range of settings.

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Auction sniping

From Wikipedia, the free encyclopedia

Auction sniping is the process of watching a timed online auction (such as on eBay or Yahoo!), and placing a winning bid at the last possible moment (often literally seconds before the end of the auction), giving the other bidders no time to outbid the sniper. Some bidders do this manually, and others use software designed for the purpose, such as Auction Sentry and Ebay Sniper. A **bid sniper** is a person or software agent who performs auction sniping.

There are also online sniping services, such as BidRobot.com, AuctionSniper.com, AuctionStealer.com and Gixen.com, where the software agent is run from a website rather than the sniper's own computer. This decreases the failure rate of the snipe, because the website is expected to have more reliable servers that might be quicker to react.

Contents

Legality

While auction sniping is frowned upon by many, it does not break any of the rules established by eBay. A few other auction sites (such as Yahoo! auctions) automatically extend the bid deadline by a few minutes if a bid is placed in the last moments of the auction to give other buyers time to react.

Uses of bid sniping

Experienced users of online auctions with "hard" ending times often prefer entering bids late in the auction to avoid **bidding wars** (multiple rounds of bidders each increasing their maximum bid to temporarily regain "current highest bid" status) or **bid chasing** (where the presence of an existing bid encourages other to bid on the same item).

Economic analysis of sniping (Roth and Ockenfels, 2000) suggests that it is a rational gain-maximizing (i.e., price-minimizing) strategy for bidders in auctions which fulfill two criteria: 1) the end time is rigidly fixed (such as those on eBay), and 2) it is possible to gain additional information about the "true" value of the item by inspecting previous bids. For example, a novice antiques buyer may prefer to bid in auctions which already have bids placed by more experienced antiques buyers, on the grounds that the items which the experienced buyers are interested in are more likely to be valuable. In this case, more informed buyers may delay bidding until the last minutes of the auction to avoid creating competition for their bids, leading to a lower winning bid. Analysis of actual winning bids on eBay (Yang and Kahng, 2006) suggests that winning bidders are more likely to have placed a single bid late in the auction, rather than placing multiple incremental bids as the auction progresses.

Objections to bid sniping

Sellers generally object to bid sniping, since widespread use of last-minute bidding reduces the number of successful bids (since some last-second bids may not be transmitted to the auction software before the auction closes due to delays in the system or other technical problems), reduces competition between bidders, and leads to a lower final price for the item.

Non-sniping bidders object to sniping, claiming that it is unfair to place bids at a point when it is impossible or unfeasable for prior bidders to evaluate and possibly counter the bid, causing them to lose auctions even though they would have been willing to meet the winning bid amount. Note that this is an economically irrational objection in the case of eBay, whose proxy bidding system is designed to allow bidders to specify the absolute maximum they are willing to bid on an item (i.e., an "economically rational" bidder will never raise their bid, since their first bid is also their maximum bid).

Deterrents

Automated bid sniping software can be defeated by requiring bidders to enter numbers presented as a distorted image prior to entering their bid, a CAPTCHA system that Eric M. Jackson stated was invented by PayPal. This ensures that all bids are entered manually but excludes people with visual disabilities from making a bid.

Some on-line auction systems attempt to discourage sniping (manual or automatic) by automatically extending the auction time if a last-minute bid is placed. This approach leaves all bidding open, and allows any bidders that are watching during the final few minutes to **counter-snipe** any snipers. This approach can sometimes be 'beaten' by running sniper software on a faster Internet connection (unless the system has bid flood protection), or by sniping against impatient and disgruntled manual bidders who 'give up' after several time extensions, but before reaching their maximum bid. It can also lead to last-minute automated out-of-control bidding wars between snipers, which could extend the bidding time long beyond what the seller desired. Any site which implements a limit to the number of time extensions allowed simply causes a **final extension snipe**.

Another method to discourage snipers is to allow bidders to place a hidden or proxy bid, indicating to the system, but not the sniper, the absolute maximum they would be willing to extend their original bid, but without actually placing a bid above the original amount unless another person bids against them. This system (which is used by eBay) can still be beaten by the sniper increasing their bid in small increments until the proxy bid is exceeded; thus, the sniper must be willing to pay a little bit more than the previous bidder's hidden maximum. Proxy bidding also discourages 'bidding wars', but on the other hand discourages 'opportunistic' bidding on low-priced items, which may sometimes be beneficial in getting bidding started and escalating the price, and which contributes to the 'energy' of an open auction.

Properly implemented, proxy bidding would be considered a type of closed auction system, where bidders cannot see the current highest bid until they've actually out-bid it, and where winners pay an incremental amount more than the second highest bid. Proxy bidding requires the wise bidder to know in advance the value of an item and their limit for bidding on it, and to have trust in their auctioneer not to disclose this limit, even accidentally.

However, improper implementation of proxy bidding introduces a new danger, a fraudulent practice known as **maximum bid fishing** (a type of shilling). For some implementations of the proxy system (such as the one used on eBay), although the server does not disclose the current maximum bid, it will indicate when a previous maximum has been outbid. This opens a loop-hole which allows an agent for the seller, using sniping software, to incrementally escalate their bid until they reach (and narrowly exceed) the current hidden maximum. They then hope to get one more bid increment out of the original bidder, thereby successfully reaching (or actually slightly

exceeding) the bidder's original maximum hidden bid. The danger to the seller in this case is that the original bidder may not choose to increase their bid, leaving the seller with a futile transaction (selling the item to themselves) which will still incur a fee from the auction service.

In all cases, bid sniping is encouraging for the sniper, discouraging for the sniped, but not illegal as the sniper must actually be willing to pay more than the next highest bidder. In the end, getting sniped is really just a 'feeling' that you 'would have' extended your bid a dollar more, 'had you only known' that someone else would themselves pay a dollar more.

Having your bid **fished-out** is a feeling that 'you should have been able to' get the item for a lower price, if the seller had not been informed of how high you would bid.

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- AuctionBytes Sniper Comparison Table (http://www.auctionbytes.com/cab/pages/sniping)
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Sniping software or websites

- Buyertools Reminder: Sniper (http://www.buyertools.com/) (software-based sniping, supports 14 eBay countries - Free)
- Gixen - completely free eBay sniper (http://www.gixen.com/) (online sniping - Free)
- BidNip (http://www.bidnip.com/) (online sniping - Free/Paid)
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English Abstract:

French Abstract:

L'invention se rapporte a un systeme en ligne de vente aux encheres de produits, qui comporte un centre d'encheres dote d'un microprocesseur fonctionnellement relie a un support de stockage de donnees. Dans ledit centre d'encheres se trouve un compte-rendu/diagramme de vehicule comportant des etiquettes pointant sur des zones specifiques du vehicule. Les vendeurs de vehicules peuvent selectionner une etiquette particuliere puis entrer dans le systeme l'etat de la partie correspondante du vehicule. En outre, il est possible d'entrer dans le systeme des estimations de couts et des commentaires. Les acheteurs de vehicules peuvent ensuite acceder au diagramme pour passer en revue les types de dommages subis par un vehicule avant d'acheter. Les acheteurs peuvent egalement obtenir une estimation du montant des depenses a engager pour reparer la partie endommagee.

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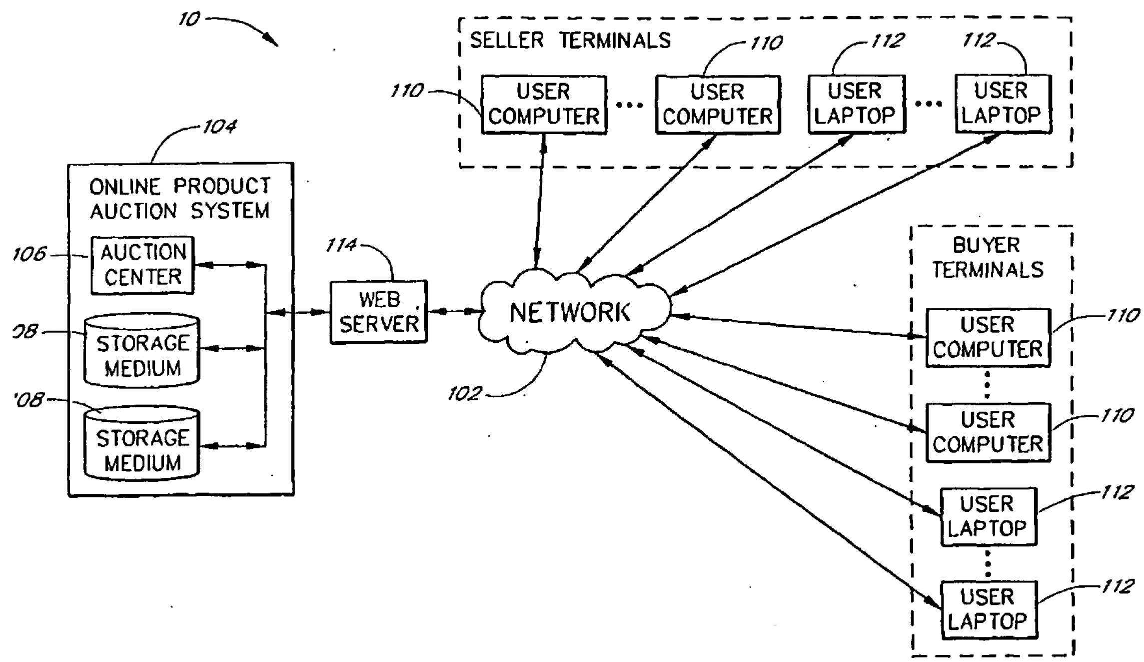

Detailed Description:

VISUAL VEHICLE REPORT
Back-ground
Field
The present invention is related to systems and methods for conducting transactions using networked computers. More particularly, the invention relates to a system and method for displaying diagrams of vehicles being bought and sold in an on-line automobile auction.

Description of the RelatedArt
Traditional auctions usually require the physical gathering of the products and the bidders at a predetermined location. An auction is scheduled to occur at a specific location at a scheduled time. Typically, interested bidders show up at the location prior to the scheduled auction time to inspect the items to be auctioned off. The bidders then attend the auction, wait for the interested products to be auctioned, and bid on these interested products.

At these traditional auctions, the products are disadvantageously made available to the interested bidders for a limited duration prior to the scheduled auction. During this limited time, the interested bidder has the task of inspecting the products which are of interest and to "book out' the product one at a time. Typical auctions may involve hundreds of products, and determining a value for each product in such a short period of time is inherently inefficient. Moreover, requiring the products to be transported to the auction location adds increased inefficiencies in the distribution channel between the seller and the buyer.

Traditional auctions have the further disadvantage that products are generally auctioned off one at a time. The auctioneer typically places a product up for auction and solicits bids from the auction floor. Once the highest bid is accepted, the product is closed to further bidding, and the next product is brought forward. This process of

auctioning off one product at a time in a sequential manner is limiting because the interested bidder may have to wait through the entire auction in order to place a bid an the interested products. Moreover, because of the high number of products and the limited auction time, a product is presented for auction for only a very short period of time. Thus, a potential bidder is not afforded the luxury of time in deciding whether to place a bid.

At some auctions, more than one auctioneer is active at a time, and thus, more than one product is capable of being auctioned off at a time. This is more efficient in that more products may be auctioned off in a lesser period of time.

But, simultaneous auctions require the interested bidder to concurrently monitor more than one auction to ensure that an interested product is not missed. This is inefficient because more than one bidder representing the same buyer has to be present at the auction. Further inefficiencies are introduced because the products cannot be auctioned off simultaneously to the same group of bidders.

More recently, the World Wide Web ("www") has experienced an increasing number of auction sites. Typically, a seller places a product up for auction through one of these sites. The seller provides information such as, by way of example, a product description, including a photograph of the product in some instances, the duration of the auction, and -Ipossibly a required minimum selling price. This information is presented through one or more web pages. A bid history is also presented through one or more web pages so that interested bidders may place a valid bid on a desired product.

These auction systems enable the simultaneous auctioning of products as well as increasing the duration of time a product is presented for auction. But, conventional auction systems are inefficient because the participating bidders have to continuously monitor their auctions in order to keep abreast of the bidding activity. Furthermore, these systems have the added disadvantage in that the interested bidders have to continuously search for active auctions involving products of interest.

Having placed a product up for auction, the seller generally loses the flexibility of altering certain auction parameters during the auction period. For example, the seller may not be permitted to alter information such as the bidding increments, the minimum starting bid, or the minimum acceptable selling bid. This is generally inefficient because the seller has to wait through an unsuccessful auction before adjusting the auction parameters such that a successful auction may result.

In current on-line auctions, any special features (e.g.: color, damage, markings) of the item being sold are normally described by text or a photo that accompanies the description of the item. This is a disadvantage because of the expense in taking photographs of every item, from all angles to show any feature. For example, in a conventional system, an automobile being auctioned is normally accompanied by a photo of the automobile and some text describing any features. However, there is no convenient mechanism for informing a buyer that there is, for example, a small scratch across the front quarter-panel.

A text description is inadequate to describe the damage because there is no uniform mechanism for the seller to relay the extent of the scratch, or the cost of repairing it to the buyer. Taking photographs of each area of the car that might be damaged is prohibitively expensive. Similarly, there is no convenient mechanism for a seller to disclose that their automobile has add-on features, such as special paint colors, engine enhancements, stereo upgrades and the like. Thus, what is needed in the art is a convenient system for displaying special features of a vehicle being sold.

Summary

One embodiment of the invention is a computer-implemented system for displaying features of a vehicle that

includes: a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a first memory for storing a rating of the condition of the vehicle part; a first indicator for indicating a first condition of the vehicle part; and a second indicator for indicating a second condition of the vehicle part.

Another embodiment of the invention is a computer-implemented system for displaying damaged areas of a vehicle that includes: a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a first memory for storing a rating of the condition of the vehicle part; a first indicator for indicating a first condition of the vehicle part; a second indicator for indicating a second condition of the vehicle part, and a second memory for storing a value corresponding to the cost of repairing the vehicle part.

Yet another embodiment of the invention is a system for gathering vehicle repair information, that has: a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a communication interface for transmitting vehicle information to an on-line repair module and receiving a value corresponding to the cost of repairing the vehicle part; and a memory for storing a value corresponding to the cost of repairing the vehicle part.

One other embodiment of the invention is a method for displaying special features of a vehicle. This embodiment includes the method of: generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part; storing a first rating of a condition of the vehicle part; and indicating the first rating of the condition of the vehicle part on the vehicle diagram.

Still another embodiment of the invention is a method for displaying the cost of repairing a part on a vehicle, comprising: generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part; storing a first rating of a condition of the vehicle part to a first memory; determining the cost of repairing the vehicle part based on the first rating; and storing the cost of repairing the vehicle part to a second memory.

An additional embodiment of the invention is a system for displaying the cost of repairing a part on a vehicle that provides: means for generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part; means for storing a first rating of a condition of the vehicle part to a first memory; means for determining the cost of repairing the vehicle part based on the first rating; and means for storing the cost of repairing the vehicle part to a second memory.

A further embodiment of the invention is a system for displaying special features of a vehicle, comprising.

means for generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part; means for storing a first rating of a condition of the vehicle part; and means for indicating the first rating of the condition of the vehicle part on the vehicle diagram.

Brief Description of the Drawings

These and other aspects, advantages, and novel features of the invention will become apparent upon reading the following detailed description and upon reference to accompanying drawings.

Figure 1 is a block diagram illustrating an embodiment of the overall network architecture of the invention.

Figure 2 is a flow chart illustrating a vehicle submission process according to one embodiment of the invention.

Figure 3 is a visual diagram of the exterior of a vehicle that includes labels pointing to relevant parts of the vehicle according to one embodiment of the invention.

Figure 4 is a visual diagram of the interior of a vehicle that includes labels pointing to relevant parts of the vehicle according to one embodiment of the invention.

Figure 5 is a flow chart illustrating a process for entering visual features of a vehicle according to one embodiment of the invention.

Figure 6 is a flow chart illustrating a process for displaying the visual features of a vehicle according to one embodiment of the invention.

Figure 7 is a flow chart illustrating a process for automatically importing data relating to features of vehicles, and calculating the costs of any repairing the vehicle based on the input features.

Figure 8 is a screen print of one embodiment of a visual vehicle report that illustrates an exterior view of a vehicle.

Figure 9 is a screen print of one embodiment of a visual vehicle report that illustrates an interior view of a vehicle.

Detailed Description

In one embodiment, an online product auction system includes an auction center. The auction center provides a network connection to which one or more seller terminals and one or more buyer terminals, as well as other network devices, may advantageously be networked. The auction center may advantageously utilize a web server to provide a network connection over a public network such as the World Wide Web ("www") or a private network. The auction center includes information regarding one or more products and facilitates the auctioning of the products by enabling potential buyers of the products to bid on the products by utilizing the buyer terminal.

Embodiments of the invention also relate to a system and method for displaying visual diagrams of vehicles in an on-line auction center. These vehicle diagrams or vehicle reports resemble the exterior, interior, or three dimensional view of a vehicle, and are displayed to both the seller and the buyer. Figures 3 and 4 discussed below provide illustrations of one embodiment of vehicle diagram. It should be noted that the vehicle being represented in the diagram or report can be an automobile, motorcycle, camper, motor home or other device for transporting people between destinations. An on-line auction system is described in co-pending U.S. Application No. 091283,120, filed on March 31, 1999 entitled CONTINUOUS ONLINE AUCTION SYSTEM AND METHOD, which is hereby incorporated by reference in its entirety.

The seller activates the vehicle diagrams after entering their car into an on-line auction center in order to enter special features or damage to the vehicle. The vehicle diagrams are preferably implemented as HTML pages on a world wide web server, and are activated through hyperlinking, or any other conventional manner.

Special features of the vehicle can be add-ons, colors, custom wheels or other non-standard items. Damaged areas of the vehicle include nicks, scratches, dents, broken components, etc. In addition, embodiments of the vehicle diagram include fields for storing a rating of the condition of any portion of the vehicle. In one embodiment, the rating scale is Excellent, Fair and Poor. However, other rating scales, such as numerical or alphanumerical are contemplated.

A buyer activates the vehicle diagrams during the purchase process to review any special features or damage to the vehicle prior to purchase. In this manner, a convenient, visual mechanism is in place for a seller to disclose damaged

or special areas of a vehicle to a buyer.

The vehicle diagram can also reflect the rating that a seller has placed on any part of the vehicle by changing the color of the label that points to the selected part. For example, a seller having a vehicle with a broken tail light would activate a vehicle diagram of a vehicle, and then click with a mouse pointer onto a "Tail Light" label (as illustrated below in Figure 3). A form is then displayed which accepts data relating to the condition of the tail light (Excellent, Fair, Poor), the cost of any repair and any seller comments.

Once the vehicle being sold is posted to the auction center, buyers can view the vehicle diagram to see if the car has any special features or damage. In one embodiment, the vehicle diagram includes color-coded vehicle parts or labels that point to sections of the vehicle that are damaged or have a special feature. By selecting the colored part or label, a form is displayed that presents the repair estimates, condition and comments that were entered by the seller.

Several modules will be described hereafter. The modules may advantageously be implemented as one or more computer program modules configured to reside on an addressable storage medium operably connected to one or more microprocessors. The modules may advantageously be configured to execute on the one or more microprocessors. An addressable storage medium will be further described below.

The auction center advantageously receives one or more products from one or more sellers. As an example, a seller may use a seller terminal to submit a product into the auction center. A product is associated with a corresponding set of product data and one or more auction parameters. The corresponding set of product data and one or more auction parameters can be considered a product auction. The set of product data may advantageously include information such as, by way of example, a product identification and one or more seller parameters such as a seller identification, a start minimum bid, a reserve bid, a decrement amount, and a low minimum bid. The auction parameter may be information such as, by way of example, a current high bid, a current high bidder, a start time, an auction timer, a bid count, a winning bid, and a winning bidder. The auction center can facilitate a product auction by utilizing information maintained in the seller parameters and one or more auction parameters.

In one embodiment, a seller proxy module executes in the auction center and may advantageously perform a seller proxy based upon one or more auction parameters. The seller proxy modifies one or more seller parameters during the product auction on behalf of the seller. As an example, the auction center may lower a start minimum bid if there are no bids in the product auction. Thus, in contrast to conventional auctions, the seller does not have to wait until a product auction completes unsuccessfully before re-auctioning the product with modified seller parameters. The auction center can monitor the product auction and modify one or more seller parameters associated with the product auction to increase the probability of a successful product auction.

A seller may advantageously request the auction center to notify the seller upon the occurrence of an event associated with the seller's product auction. The events may advantageously include one or more of the following: a transition from one product auction state to another product auction state, a seller proxy, a successful product auction, and a receipt of a bid. The seller may further specify the form the notification is to take. Thus, the seller does not have to expend resources to unnecessarily monitor the seller's product auction. Rather, the auction center can be configured to automatically notify the seller accordingly, thus enabling the seller to make better use of the seller's resources.

A bidder uses a buyer terminal and a web browser executing on the buyer terminal to establish a connection over the network to the auction center. Once connected, the auction center advantageously displays a web page which the

bidder can use to log on to and navigate through the auction center to locate a desired product auction. The bidder can then place a proxy bid in the desired product auction using the one or more web pages displayed on the buyer terminal.

A bid processing module executes in the auction center and processes an incoming bid in a product auction contained in the auction center. More particularly, the bid processing module is configured to accept a proxy bid request in the product auction from a bidder. The proxy bid request may include bid parameters such as, by way of example, an initial bid and a top bid. The initial bid and the top bid are used by the bid processing module to perform proxy bids on behalf of the bidder. The initial bid is the bidder's first bid for the product. The top bid is a cap figure that the bid processing module is not to exceed in generating a proxy bid. The bid processing module will then advantageously bid on behalf of the bidder if a subsequent bidder places a higher bid in the product auction. The bid processing module generates a proxy bid on behalf of the bidder as long as the higher bid submitted by the subsequent bidder does not exceed the top bid specified by the bidder. In another embodiment, the bidder may further specify a bid increment to be used by the bid processing module in generating a proxy bid on the bidder's behalf. In yet another embodiment, the bidder may further specify a time parameter which is used in delaying the bidder's proxy bids. As an example, the bidder may specify that his or her proxy bids are to be submitted ten (10) minutes after a subsequent higher bid is received from a different bidder. As another example, the bidder may specify that his or her proxy bids are to be submitted twenty (20) minutes before the close of the auction.

In one embodiment, if the top bid specified by the bidder is insufficient for the bid processing module to generate a proxy bid on behalf of the bidder, the auction center is advantageously configured to alert the bidder of the insufficient top bid. As an example, the auction center may alert the bidder by sending an e-mail message. Once alerted, the bidder may place a subsequent bid, or another proxy bid, in the desired product auction. Thus, in contrast to conventional auctions, the bidder does not have to continuously monitor the product auction to determine if the bidder has been outbid.

The auction center permits the bidder to effectively specify a range of bids that are acceptable to the bidder by placing a proxy bid. The lowest possible bid in the range of bids becomes the bidder's effective bid. The auction center can advantageously monitor the product auction for the bidder and place subsequent bids when necessary on behalf of the bidder. Furthermore, the auction center may advantageously alert the bidder if a subsequent bid is higher than the range of bids specified by the bidder thus precluding the auction center from placing a proxy bid on behalf of the bidder. Thus, rather than the bidder having to expend resources to monitor interested product auctions, the auction center facilitates a better utilization of the bidder's resources.

Even though the invention is suitable for auctioning any product, the invention will be further disclosed in the context of auctioning a vehicle. Throughout the drawings, components which correspond to components shown in previous figures are indicated using the same reference numbers.

The conventional vehicle auctions are inherently inefficient. Typically, a vehicle auction provider establishes a date, time, and location for a vehicle auction. The vehicles to be auctioned off, which may number in the thousands, are transported to the auction site in preparation for the vehicle auction. The interested buyers gather at the auction site one or two days prior to the scheduled auction to inspect, and 'book out," the vehicles one vehicle at a time. At this time, the potential buyers select the vehicles of interest, and initially associate a bid value to the selected vehicles.

The actual auction typically includes one or more auction lines. The vehicles are lined up, one after another, at one

end of the auction line. The vehicles then proceed down the auction line. When a vehicle reaches a designated point on the auction line, typically the end of the auction line, the vehicle is put up for bidding. The bidding process typically takes no more than a few minutes. At the close of the bidding, the vehicle proceeds off the line, and the subsequent vehicle proceeds forward, and is put up for bidding. The potential buyers stand on both sides of the auction line and place bids as the vehicles are put up for bidding. For each auction line, one vehicle can be put up for bidding at a given time.

Therefore, if the auction involved three auction lines, there could be three vehicles up for bidding simultaneously.

Accordingly, it is not uncommon for several bidders representing one entity to be attending a single vehicle auction in order to adequately cover the multiple auction lines. Thus, the conventional vehicle auction typically generates a high degree of tension in that the vehicles are auctioned of in rapid succession. Furthermore, the potential buyers may not have enough time to make proper bidding decisions.

Conventional electronic vehicle auctions, conducted using computers and dial-up connections, address some, but not all, of the problems associated with the conventional vehicle auctions. Typically, a vehicle auction provider sets the time and location for a vehicle auction. Potential buyers are thus alerted to dial into and log on to a particular location, generally a computer system executing an auction program, to participate in the vehicle auction. The vehicles to be auctioned off may be made available for inspection at a designated time prior to the scheduled vehicle auction. The inspection is typically performed over the dial-up connection, whereby a potential buyer inspects the vehicles by accessing vehicle descriptions, and possibly vehicle photographs, from a remote computer.

At the scheduled auction time, the vehicles proceed down an "electronic auction line" one vehicle at a time. The potential buyers are informed by the conventional auction system as the vehicles proceed down the electronic auction line.

Much like the traditional auction, a vehicle is put up for bidding once it reaches a specific point on the electronic auction line. The bidding takes place over the computer network as potential buyers submit bids for the vehicle. The bidding process for a vehicle generally takes no more than a few minutes. Thus, conventional electronic vehicle auctions, while alleviating the need for the potential buyer to be physically at the auction site, tail to address the tension and inefficiency associated with the need to closely monitor the vehicles proceeding down the auction line and make split second bidding decisions. During the electronic vehicle auction, a potential buyer cannot divert his or her attention to any other task but the vehicle auction itself. Furthermore, vehicles which were not purchased during the auction, generally because they failed to generate the necessary bidding activity, typically are allocated for participation in another vehicle auction. The electronic vehicle auction system, because of the time limitation, does not provide a mechanism by which auction parameters may be modified while a vehicle is up for bidding in an effort to generate the necessary bidding interest.

In contrast to the conventional vehicle auctions, the present invention facilitates an efficient allocation of resources. A potential buyer may advantageously focus his or her attention on tasks other than the vehicle auction by requesting the vehicle auction system to perform one or more tasks on behalf of the potential buyer. As an example, the vehicle auction system can monitor the bidding activity and submit proxy bids on behalf of the potential buyer.

Additionally, the vehicle auction system can notify the potential buyer of certain events, thus permitting the potential buyer to tend to other duties until attention is needed. A seller of a vehicle through a vehicle auction may likewise request the vehicle auction to perform one or more tasks on behalf of the seller. As another example, the seller may advantageously request the vehicle auction to perform one or more seller proxies on the seller's behalf.

The vehicle auction can accordingly monitor the bidding activity associated with the vehicle auction and adjust one or more seller parameters to increase the probability of a vehicle sale.

In one embodiment of the invention, an online product auction system facilitates the auctioning of a vehicle. The product auction system provides a network connection with which a seller can access the product auction system over the network to submit a vehicle to be auctioned off by the product auction system. The product auction system offers the submitted vehicle in a vehicle auction. A potential buyer can access the product auction system through the network I 0 connection to place one or more bids in a vehicle auction.

Computer networks suitable for use with the present invention include local area networks (LAN), wide area networks (WAN), Internet, or other connection services and network variations such as the World Wide Web, the public internet, a private internet, a private computer network, a secure internet, a private network, a public network, a valueadded network, and the like. The computers connected to the network may be any microprocessor controlled device that 1 5 permits access to the network, including terminal devices, such as personal computers, workstations, servers, mini computers, main-frame computers, laptop computers, mobile computers, palm top computers, hand held computers, set top box for a TV, or a combination thereof. The computers may further possess input devices such as a keyboard or a mouse, and output devices such as a computer screen or a speaker. The computer network may include one or more LANs, WANs, Internets, and computers. The computers may serve as servers, clients, or a combination thereof.

One network architecture suitable for use with one embodiment of the invention is indicated generally by a system 1 0 in Figure 1. The system 1 0 may include a network 1 02, which represents a computer network as previously described, providing network connection between the attached devices. The system 10 may further include an online product auction system 104 which is connectable by one or more buyer terminals and one or more seller terminals through a web server 1 14. The online product auction system 1 04, the buyer terminals, and the seller terminals may be connected to the network 102 directly or through a connection device such as a router or other similar mechanisms.

In one embodiment, the system 10 conforms to the Transmission Control Protocol/Internet Protocol (TCP/IP) industry standard. In other embodiments, the system 10 may conform to other network standards, including, but not limited to, the International Standards Organization's Open Systems Interconnection, IBM's SNA , Novell's Netware , and Banyon VINES , that facilitate communication between the attached devices.

In one embodiment of the invention, the online product auction system 104 includes an auction center 106 and one or more storage mediums 108. The auction center 106 is operably connected to a storage media such as, by way of example, random access memory, non-volatile storage media, or the storage medium 108. The online product auction system programs and the online product auction system databases comprising the online product auction system 104 preferably reside on one or more computers, which is any device having a microprocessor operably connected to some storage memory device, comprising the auction center 106 and one or more storage mediums 108. Those of ordinary skill in the art will realize that the storage mediums 108 may advantageously be contained in the computer(s) comprising the auction center 106.

These computers may be uniprocessor or multiprocessor machines. Additionally, these computers include an addressable storage medium such as, by way of example, random access memory, and may further include a non-volatile storage medium such as, by way of example, a magnetic or an optical disk. The addressable storage medium and/or the non-volatile storage medium may advantageously contain a specific physical substrate configuration such as, for example, a computer program, representing data and instructions which cause the

computer to operate in a specific and predefined manner as described herein.

The network 102 may connect devices, such as a user computer 1 1 0 or a user laptop 1 12, for example, by use I 0 of a modem or by use of a network interface card. As illustrated, potential buyers and sellers may utilize such devices to remotely access the online product auction system 104 via the network 102. The device used to provide the buyer access to the online product auction system 104 and the auction center 106 may be referred to herein as a buyer terminal. The device used to provide the seller access to the online product auction system 104 and the auction center 106 may be referred to herein as a seller terminal. The terms buyer terminal and seller terminal are intended to include any device 5 useful for providing access to the online product auction system 104. The buyer terminals and the seller terminals may also be referred to herein as user terminals. Moreover, the same device may function as both a buyer terminal and a seller terminal.

Although particular computer systems and network components are shown, those of ordinary skill in the art will appreciate that the present invention also works with a variety of other networks and components.

In accordance with one embodiment of the invention, the online product auction system 104 is connected to the Internet and utilizes the web server 114 to provide connection capabilities over a World Wide Web ("www"). The web server 114 may advantageously be executing a standard web server such as, by way of example, the Microsoft Internet Information Server. A remotely located potential buyer may access the online product auction system 104 by utilizing a standard web browser such as, by way of example, Netscape Communicator software, executing on a buyer terminal and establishing a network connection to the web server 1 14. Likewise, a remotely located seller may access the online product auction system 104 by utilizing a standard web browser executing on a seller terminal and establishing a network connection to the web server 1 14. Via the web server 1 14, the potential buyer and seller may advantageously be provided with web pages that display vehicle diagrams enabling the buyer and seller to access the online product auction system 104.

In one embodiment, the storage medium 1 08 may be configured as a database from which information can be both stored, updated, and retrieved. In one embodiment, the database is a System Guery Language (SOL) database that accesses information from a SOL server. The information may advantageously include one or more of the following.

product data, bid data, seller parameters, auction parameters, and definitions of one or more web pages comprising the online product auction system 104. The online product auction system programs may provide access to the information stored on the storage medium 1 08.

Figure 2 is a flow chart generally illustrating a process 200 of a seller submitting a vehicle to the auction center 106 and entering visual feature of the vehicle, according to one embodiment of the invention. The subsequent steps may advantageously be implemented as one or more program modules configured to reside on one or more storage mediums 106 and executed on one or more processors residing in one or more auction centers 106. In particular, at a step 202, a potential seller utilizes a web browser executing on a seller terminal to access the auction center 1 06 login web page. The potential seller submits a login identification and a password pair through the login web page. In one embodiment, a unique login identification and password pair can be previously obtained from an auction center administrator. In another embodiment, the auction center 106 may include definitions of one or more web pages which may advantageously provide an online contract to the seller. The seller can then access and submit the online contract through the seller terminal and subsequently obtain a login identification and password pair with which to access the auction center 106.

At a step 204, the seller submits a vehicle to be auctioned off by the auction center 106. Each vehicle comprises a unique vehicle auction. In one embodiment, the seller can submit vehicles to the auction center 106 one vehicle at a time. Each vehicle can be identified by a set of product data stored in memory which is associated with the vehicle. The product data may advantageously be comprised of a vehicle identification and one or more seller parameters.

A product receive module is configured to execute in the auction center 106 and receives the product data associated with the vehicle. In another embodiment, the seller may also submit one or more sets of product data into the auction center 106 from a database. In particular, the database can be comprised of one or more used vehicle records detailed in the aforementioned patent application. Those of ordinary skill in the art will realize that the database may be local to the online product auction system 104 or remotely located, and thus, connected to the online product auction system 104 via the network 102.

After the vehicle has been submitted for the auction, a determination is made at a decision state 205 whether any special features need to be added to the vehicle record. If a determination is made that no features need to be entered, the process 200 moves to a state 206 to post the offer for sale.

At the post offer step 206, the seller provides the seller parameters that additionally comprise the product data associated with the vehicle. The seller parameters preferably are one or more of the following: a start minimum bid, a reserve bid, a decrement amount, and a low minimum bid. The start minimum bid is the amount the seller would like the bidding for the seller's vehicle to start at. The auction center 106 makes the start minimum bid specified by the seller available to a potential bidder. The low minimum bid and the decrement amount are parameters used by the auction center 106 in performing seller proxies on behalf of the seller and are not made known to potential bidders. Every time a seller proxy is performed, the start minimum bid is decremented by the decrement amount. The low minimum bid is a floor figure which the start minimum bid cannot be set smaller than. The reserve bid is a contractual figure in that the seller is promising to sell the vehicle if a winning bid is at least as much as the specified reserve bid. The specified reserve bid, as well as the decrement amount and the low minimum bid, are not made known to potential bidders. Some or all of the seller parameters may not be required, and the omitted seller parameters may be supplied by the online product auction system 104.

In one embodiment, the start minimum bid is the desired starting bid that the seller is requesting for the vehicle auction. In one embodiment, the auction center 106 can accept bids less than the start minimum bid for the vehicle auction. In another embodiment, the auction center 106 can he configured to not accept any bids less than the start minimum bid amount. The reserve bid is the amount for which the seller is willing to sell the vehicle. If a winning bid for the vehicle auction is less than the reserve bid specified, the seller may, but is not obligated to, sell the vehicle for the winning bid. In one embodiment, the reserve bid may be specified to be any amount. In another embodiment, the auction center 1 06 may require the reserve bid amount to be as large as the start minimum bid amount.

For example, in a vehicle auction, the seller may specify a start minimum bid of $10,000 and a reserve bid of $8,000. In this instance, it may be advantageous for the auction center 106 to accept bids less than the start minimum I 0 bid of $10,000 in the vehicle auction. In one embodiment, the auction center 106 may advantageously accept bids less than the reserve bid of $8,000. This may allow interest in the vehicle auction to build and may lead to additional bids in the vehicle auction. The seller is not disadvantaged because the seller is not obligated to sell the vehicle for an amount less than the reserve bid of $8,000.

In another embodiment, the auction center 106 may require a bidder to submit a bid amount greater than the 5

reserve bid of 8,000. If the bid amount is less than $8,000, the auction center 106 can advantageously display an error message alerting the bidder of this fact. If the auction center 106 is configured to not accept bids less than the start minimum of $10,000, then the reserve bid of $8,000 may be rendered effectively meaningless, unless the seller has requested seller proxies, and the auction center 106 may advantageously set the reserve bid to the start minimum bid. In this instance, the auction center 106 may require the reserve bid to be as large as the start minimum bid. In still another embodiment, the start minimum bid may also function as the amount the seller is willing to sell the vehicle for. In this instance, the reserve bid may not be required.

In one embodiment, a seller proxy module is configured to execute in the auction center 106 and performs seller proxies on behalf of a seller. A seller proxy is an adjustment of one or more seller parameters associated with a vehicle auction in an active state. Vehicle auction states will be further discussed below. In one embodiment, the adjustment is advantageously based on whether a bid has been received in the vehicle auction. When the seller proxy module executes, it can determine if the vehicle auction has received any bids. If a bid has been received, the seller proxy module will not perform a seller proxy in the vehicle auction. If a bid has not been received, the seller proxy module can determine if the start minimum bid is larger than the sum of the low minimum bid and the decrement amount. If the start minimum bid is larger, then a seller proxy can be performed. As an example, a seller may advantageously specify a start minimum bid of $8,000, a decrement amount of $200, and a low minimum bid of $7,000 in offering a vehicle for auction. If the vehicle auction has not received a bid, a seller proxy decrement will advantageously be performed, and the start minimum bid is decreased to $7,800. In another embodiment, a seller proxy can be performed as long as the start minimum bid is larger than the low minimum bid and a bid in an amount equal to or greater than the reserve bid has not been received for the vehicle auction. If decreasing the start minimum bid by the decrement amount causes the start minimum bid to be smaller than the low minimum bid, then the start minimum bid will advantageously be set equal to the low minimum bid.

-1 IIn one embodiment, the seller proxy module is executed by the auction center 106 at appropriate time intervals.

The time interval may advantageously be predetermined by the auction center 106 and is substantially long enough to allow potential bidders to become aware of the vehicle auction and to submit bids in the vehicle auction. The time interval may not be too long such that the vehicle auction will close without generating the desired interest as measured by the number of bids. In one embodiment, the time interval is one (1) hour such that the proxy module is executed every one hour on the hour. In another embodiment, the time interval may be set to a figure substantially less than one (1) hour or substantially greater than one (1) hour. In still another embodiment, the time interval may be dynamically reduced by the auction center 106 based on the time remaining before the vehicle auction closes. In a further embodiment, the seller may specify, for a seller's vehicle auction, a time interval which determines the frequency the seller proxies are performed. In I 0 still a further embodiment, the seller may specify a variable time interval which determines the frequency in which seller proxies are performed. As an example, the seller may specify that the seller proxies are to be performed with increasing frequency as the vehicle auction progresses in time.

The auction center 106 contains one or more vehicle auctions submitted by one or more sellers. Each vehicle auction includes an auctioning of one vehicle. Some of the sellers requested seller proxies to be performed by the auction center 106 for their vehicle auctions. Other sellers did not request seller proxies to be performed on their behalf. The seller proxy module, at the time of execution, has to determine the vehicle auctions that requested seller proxies, and perform the seller proxies on behalf of the seller.

In one embodiment, the seller proxy module can determine the vehicle auctions that requested seller proxies by using a seller proxy list maintained in memory. The seller proxy list identifies vehicle auctions that are currently in the active state and that have requested seller proxies to be performed. For example, if the seller specifies a decrement amount greater than zero (0), the vehicle auction can be included in the seller proxy list at substantially the time the vehicle auction becomes active. The seller proxy module then takes the vehicle auctions identified in the seller proxy list one at a time and performs the seller proxies on behalf of the seller. If, in performing the seller proxy, the seller proxy module determines that subsequent seller proxies cannot be performed in the vehicle auction, the vehicle auction is removed from the seller proxy list. As one example, if the seller proxy module determines that a vehicle auction has received a bid, then the vehicle auction can be removed from the seller proxy list. As another example, if the start minimum bid is not greater than the low minimum bid for a vehicle auction, the vehicle auction can be removed from the seller proxy list. As still another example, if the vehicle auction no longer is in the active state, then the vehicle auction is removed from the seller proxy list.

In another embodiment, the auction center 106 may use a default decrement amount such as $100. In this instance, the seller can request seller proxies to be performed by specifying a different value for the start minimum bid and the low minimum bid for a vehicle auction. For example, the seller can request seller proxies by setting the low minimum bid lower than the start minimum bid. The vehicle auction can then be included in the seller proxy list upon becoming active. Vehicle auction states will be further discussed below.

In one embodiment, the seller advantageously provides additional product data such as, by way of example, a vehicle condition and a vehicle title statement. For example, the vehicle condition may be either good, fair, or poor. The vehicle title statement comprises information such as, by way of example, free and clear, odometer rollbacks, and frame damage. In another embodiment, the seller may request an independent third party vehicle appraiser, through the auction center 106, to determine either, or both, the vehicle condition and the vehicle title statement. The third party vehicle appraiser can be pre-selected by the online product auction system administrator to provide this service. The auction center 106 can then contact the appropriate vehicle appraiser and provide the appraiser the information necessary for the appraiser to perform the requested service.

At a set offer settings step 208, a seller may advantageously request the auction center 1 06 to notify the seller based upon one or more seller specified auction events. The auction events may include activities such as, by way of example, a receipt of a bid, a seller proxy, and a vehicle auction state change. Furthermore, the seller can specify the method of notification. As an example, the seller can request the auction center 106 to notify the seller by a means such as e-mail, page, fax, or phone. Once the offer settings step 108 has been completed, the process 200 moves to an end state 21 0 wherein the process 200 terminates.

If a determination was made at the decision state 205 that a visual feature did need to be added into the auction system, the process 200 moves to a process state 220 wherein a vehicle diagram of the exterior of a vehicle is displayed to the seller. The vehicle diagram resembles a two-dimensional overhead view of a vehicle and includes labels having arrows pointing to specific areas of the vehicle. The visual features that can be entered include "damage' items such as tears, dents, scratches and broken components. In addition, the visual features can include special additions to the car, such as upgraded stereos, weatherproofing, painted accents, flared fenders and the like. The process of entering this data into the system is explained more completely in Figures 3 Once the visual features are entered by the seller, the process 200 moves to the state 206 to post the offer to the auction center, as discussed above.

Figure 3 is a vehicle diagram 300 showing an overhead two-dimensional view of the exterior of a vehicle 302.

The diagram 300 includes several labels 306 that describe, and point to, specific parts of the vehicle 302. For example, a label 305 includes the word 'Grill" and is connected via an arrow to the Grill area of the vehicle 302. Each label is displayed in a specific color, such as green, to indicate that the part corresponding to the label is in an "Excellent" condition. Color-coded indicia 310a-c are presented to the seller that illustrate the colors of Excellent 31 Oa, Fair 310b and Poor 310c conditions of vehicle parts.

In one embodiment, the green color is the default color for the system so that parts of the vehicle having no seller data are always displayed in this color. Once a seller has indicated that a particular part is in a "Fair" or "Poor" condition, the color of the label changes to, for example, yellow or red, respectively. Of course, it should be understood that the invention is not limited to any particular label colors. In addition, changing the condition of a particular part could also lead to other label changes, such as different shading, size or shape.

The vehicle diagram 300 is preferably displayed as part of an HTML web page so that each of the part labels is a hyperlink. Selecting the hyperlink causes a form window to open and accept data relating to the selected label. Several -1 3well-known methods and languages are known for activating pages and forms on an HTIVIL web page. For example Perl and Java (Sun Microsystems, Palo Alto, CA) languages can be used to activate form controls on an HTML web page.

For example, if the Grill label 305 is selected, a form opens requesting information on any damage to the Grill. The seller can then rate whether the Grill is in "excellent," "fair," or "poor" condition. In one embodiment, the rating is entered by moving a slide bar on the form. By moving the slide bar to a particular location, a bit is set in memory that corresponds to the condition of the part. Of course, the rating could also be entered into a numeric field within the form, or by any other conventional method.

A field is also displayed on the form that accepts an estimate into memory for the cost of repairing for example, the Grill. In addition, a comment field is available for storing a text description of the damage to the Grill to a I 0 memory. Once a "Done" button is pressed, the data stored in memory relating to the Grill is saved to an Auction Disclosure Table within the system, as explained below in Figure 5.

In addition, the color of the Grill label 305 is changed to reflect whether the condition of the Grill is in excellent (green), fair (yellow), or poor (red) condition. Once the visual features have been entered, the process 200 moves to the state 206 wherein the offer is posted to the auction center.

5 Figure 4 is a vehicle diagram 400 showing a two dimensional image of the interior of a vehicle. The vehicle diagram 400 is preferably presented on an HTML web page, and includes a interior diagram 405 of a vehicle and a series of labels pointing to specific portions of the vehicle interior. For example, an "A/C' label 410 points to the air conditioning controls on the dashboard of the vehicle. If the air conditioning system is damaged, the seller can activate the A/C 41 0 label to open a form that accepts data relating to the damaged air conditioner. Within the form, the seller can select whether the air conditioner is in excellent, fair or poor condition by using a slide bar. Depending an the condition of the air conditioner, the AIC label 410 will change to a different color. For example, red label color indicates that the A/C is in a poor condition, whereas a yellow label color indicates that the A/C is in a fair condition.

Similar to the vehicle display 300 (Figure 3), the vehicle display 400 includes indicia 420a-c that provide a color code for the condition of the interior vehicle parts.

Figure 5 describes the process 220 (Figure 2) that a seller undertakes to enter vehicle diagram features into the on-line auction center. The process 220 begins at a start state 502 and moves to a state 506 wherein a vehicle diagram of the vehicle (Figure 3) is displayed on a web page to the user. The process 220 then moves to a decision state 510 to determine whether any labels have been selected by the seller for entering vehicle diagram information. If no labels were selected, the process loops until a selection has been made.

However, once a seller has selected a particular label at the decision state 510, the process 220 moves to a state 516 wherein the vehicle part that has been selected is determined. It should be understood that each part within a vehicle is assigned a value. For example, Table 1 below illustrates several vehicle labels and their associated part numbers.

TABLE I

Vehicle Part Numbers

LABEL	PART NUMBER
Hood	1
Trunk	2
Radio	3
Exhaust Pipe	4
Headlights	5
Front Bumper	6

The vehicle part number that has been selected by the user is determined by the particular label hyperlink that was activated when the seller clicked their mouse over the label. Because each label is associated with a particular part number, the part number is easily determined after the seller chooses a feature to modify.

The process 220 then moves to a state 520 wherein an Auction Identification number (Auction ID) for the particular vehicle is determined. Normally, each vehicle that is posted to the auction center to be auctioned has a specific Auction ID number to distinguish it from all other vehicles taking part within the auction. Thus, the Auction ID number is unique for the seller's vehicle within the auction center. The Auction ID number is normally generated when the seller first enters the auction site and chooses to enter a new car into the auction.

The process 220 then moves to a state 526 wherein the rating for the selected part entered into the form is stored to a memory. Of course, it should be noted that any type of memory is contemplated to function within the scope of the invention. For example, a random access memory, hard disk memory, or floppy disk memory are an anticipated function within embodiments of the invention.

Once the rating has been stored to a memory at the state 526, the process 220 moves to a state 530 wherein the damage value is stored to a memory. As discussed above, the damage value is the seller's estimate of how much it will cost to repair the selected part. The damage value would be normally entered in units of a conventional currency, such as U.S. dollars.

The process 220 then moves to a state 534 wherein any comments concerning the damaged part are entered by the seller and thereafter stored to a memory. The process 220 then moves to a state 540 wherein all of the values, including the vehicle part number, auction I.D. number, rating, damage value and comments are stored to an Auction Disclosure Table, as illustrated below in Table 2.

TABLE 2
Auction Disclosure Table

VEHICLE DAMAGE/ PART I.D.	AUCTION I.D.	RATING	VALUE	COMMENTS
1	515	1	$350	Hood has small scratch
2	704	3	$600	Small dent
7	304	2	$800	Minor tear

Once all of the values illustrated above in Table 2 have been stored to the Auction Oisclosure Table, the process 220 moves to a state 544 wherein the vehicle diagram is updated to so that the color of the selected part label indicates condition of the part. As discussed above, if the condition of the part is excellent, the label is colored green. If the condition is fair, the label is colored yellow and if the condition is poor, the label is colored red. Of I 0 course, one of ordinary skill could represent ratings in any color without departing from the spirit of the invention.

Once the screen containing the vehicle diagram has been updated at the state 544, the process terminates as an end state 548.

Figure 6 illustrates a process 600 for displaying and reviewing vehicle diagrams to a buyer within the auction system described herein. The process 600 begins at a start state 602 and moves to a state 606 wherein the Auction 5 Disclosure Table (exemplified in Table 2) is opened in response to a buyer activating a vehicle diagram. This process occurs after the buyer has decided which vehicle to review and then selects an icon or other indicia that leads to activation and display of the vehicle.

Once the Auction Disclosure Table has been opened at the state 606, the process 600 moves to a state 61 0 wherein the part numbers associated with the vehicle are read into a memory. As discussed above in Table 1, each part of the vehicle that has a label is also assigned a corresponding part number.

The process 600 then reads the ratings associated with the part numbers at a state 614 in order to correlate a rating with each part number on the vehicle. As discussed above, the ratings correspond to the condition of the part, such as excellent, fair, or poor. Each part number is initially assigned a rating of "Excellent" as the default.

The process 600 then moves to a state 61 8 wherein the color of the part label is set appropriately to reflect 2) 5 the rating that is read into memory at the state 614. For example, a part number having a rating of poor would have the part label set to display in a red color at the state 61 8. Once all of the colors for each part label have been set at the state 61 8, the process 600 moves to a state 620 wherein the diagram of the vehicle and the labels are displayed to the buyer. Examples of these diagrams are exemplified in Figures 3 and 4.

Once the diagram has been displayed at the state 620, a determination is made at the decision state 624 whether any of the labels have been selected by the buyer. In this context, selection includes clicking a mouse pointer over the label in order to activate a hyperlink that accesses a form for displaying the previously entered seller's data.

If a determination is made that no labels were selected at the decision state 624, the process 600 cycles until such a -1 6selection is made. Once a selection is made at the decision state 624, a form is displayed showing the rating, comments, and repair estimates that had been entered by the seller for the selected part. In this manner, the buyer is advised of the type of repair necessary for the car, and the cost for undertaking such a repair. The process 600 then terminates at an end state 630.

Figure 7 is a flow diagram of a process 700 for automatically calculating the cost of repairing a particular vehicle part. This process can be used, for example, by larger vehicle fleet sales units to automatically capture information on damaged car parts. Once this data is gathered it can be displayed through a vehicle diagram to disclose damaged vehicle parts to a potential buyer as shown in state 530 of Figure 5.

The process 700 begins at a start state 702 and then moves to a state 704 wherein a data collector stores I 0 vehicle identification numbers (VIN), part numbers, part ratings and part comments for all vehicles in a fleet to a table.

This data can be gathered by field agents or other individuals hired to assess the condition of vehicles. The table that stores this data is preferably an Auction Database Table, similar to Table 2 described above. Of course, other embodiments of the invention would include tables having a variety of formats for storing this information.

Once the data has been collected at the state 704, the process 700 selects a first vehicle at a state 706 to analyze for damage. At a state 708, the VIN is parsed to determine the type of vehicle under consideration. As is known, standard VINs include codes for determining the make, model, and type of vehicle having the VIN. In addition, the VIN can include other useful information, such as the transmission type of the car or whether it is a convertible or not. Moreover, the VIN can be fed into a separate database of vehicle information to determine, for example, whether the vehicle has been in a previous accident, or has special features that are unique to the selected vehicle. One source of such information would be the local Department of Motor Vehicles. The information relating to the type of vehicle is then used to determine the repair cost(s) to correct any damage.

Once the VIN has been parsed at the state 708, the process 700 moves to a decision state 71 0 to determine whether the currently selected vehicle has any damaged parts. If any of the parts are marked as damaged, as determined by reference to a part rating that is not "Excellent", the process 700 moves to a state 714 wherein the type of vehicle, damaged part number, and part rating are sent through a communication interface to an on-line repair estimation module.

Several companies provide an on-line service that includes modules for estimating the cost of repairing vehicles. These modules accept input of a particular vehicle type, damaged part identifier and the extent of any damage (e.g.: a damage rating). The company then references insurance adjustment tables to calculate an estimate for repairing the damaged part. For example, the CCC Information Services, Inc. (Chicago, IL, www.cccis.com) provides such a service.

Once an estimate or value of the repair cost is generated by the on-line service, the process 700 then receives a repair estimate at a state 71 6 from the on-line estimation module and stores the part repair estimate to the table at a state 720. A determination is then made at a state 724 whether more damaged parts were found on the present vehicle. If more damaged parts do exist, the process 700 cycles back to the state 714 in order to transmit the - 1 7type of vehicle, damaged part number and part rating for the new part to an on-line repair estimation module.

However, if no more damaged parts exist for the vehicle at the state 724, the process 700 moves to a state 726 wherein the total costs for repairing the vehicle are determined.

This total is determined to address situations wherein the cost of performing one repair affects the cost of performing a second repair. For example, if the first repair is to the front of the transmission, and the second repair is to the rear of the transmission, the total cost of performing both repairs is likely to be lower than simply adding the

costs of the first and second repairs together. Once a value is established for the total cost of repairing the vehicle, the individual costs can be pro-rated appropriately and stored to a memory in the system.

The process 700 then moves to a decision state 730 to determine whether more vehicles exist to be analyzed. If no more vehicles exist, the process terminates at an end state 734. However, if more vehicles do exist to be examined, the process moves to a state 736 wherein the next vehicle to be analyzed is selected. The process 700 then returns to the state 708 to parse the VIN of the newly selected vehicle.

Other Embodiments

Although a set of vehicle diagrams has been described above, the invention is not limited to these particular embodiments. For example, three-dimensional representations of a vehicle are contemplated wherein the image can be rotated in all directions to inspect whether any damage has been done to the vehicle. As the image is rotated, various labels appear on the screen with pointers to specific parts of the vehicle. The labels lead via hyperlinks to forms that receive and store a full description of any damage to a table.

The system can include vehicle diagrams that illustrate particular sub-sections of the vehicle, such as, for example, the drive train. In this embodiment, a diagram of the drive train of the vehicle is illustrated that includes the engine, transmission and axles. Labels point to the parts of the drive train that could be damaged or be in need of repair. Other similar diagrams could be of the engine system, brake system or exhaust system. In this embodiment, the conditions associated with each part might be expanded beyond "Excellent", "Fair" and "Poor" to include, for example, "vibrating", "rattling", "noisy" or other conditions that are associated with the particular diagram.

In addition, the area of the car that is damaged can be color-coded in a manner similar to the color-coded labels described above so that it is readily apparent to a buyer which areas of the car have been in an accident. In one embodiment, damaged areas of the car are color-coded red within the three-dimensional diagram to indicate severe damage. Examples of visual vehicle schematicsidiagrams are illustrated in Figures 8 and 9 which are screen prints of
no
exterior and interior views of a vehicle.

As shown in Figures 8 and 9, a series of labels point to various portions of the vehicle. As shown in Figures 8 and 9, embodiments of the invention include indicias of stoplights 800a-c. The indicias of stoplights provide a legend for the color of part labels wherein an "Excellent" rating is stoplight inclicia 800a (green), a "Fair" rating is stoplight inclicia 800b (yellow) and a "Poor" rating is stoplight indicia 800c (red).

-1 8It should also be noted that these schematics could be used in a variety of different environments outside of the auction area. For example, a vehicle evaluator with the job of analyzing vehicle damage could enter damage information and condition ratings to a laptop computer. That data could be electronically transferred into the vehicle diagram system so that the damage and rating information was available to buyers and sellers of the vehicles. This system would facilitate consumer to consumer sales as well as retail car lot to consumer sales.

Once a color code has been established, the system can include a pull-down menu that describes each condition in more detail. For example, if a bumper part is marked as "Poor', the seller could activate a menu that displayed more information an the state of the bumper. Such information might be "bent' or "dinged" to relate the extent or type of damage more specifically to the seller.

A three-dimensional vehicle diagram can be implemented in many well-known manners, such as through the use of the virtual reality modeling language (VRML) which provides three-dimensional models for internet browsers.

More information can be found on the Internet at www.vrml.or
q. Through the use of a VRML modeling software
package and Internet browser plug-in, a three-dimensional image of a car can be created and rotated by a user about any axis. Thus, a seller can turn, flip, and rotate a car in any direction to look for potential damage sites. Thus, embodiments of the invention are not limited to two-dimensional images of a vehicle.

Moreover, aspects of the invention are not limited to automobiles, but can be used to display diagrams of motorcycles, trucks, motor homes, boats, airplanes, or any other vehicle that might be bought or sold at auction.

Moreover, it is possible to create a diagram of a vehicle and thereafter define an image map that overlays the diagram. A potential car purchaser could then move a mouse pointer over the diagram to select an area for inspection.

For example, the buyer might move the mouse arrow to the trunk and press a mouse button while the arrow is on the trunk. The image map that overlays the diagram would calculate the position of the mouse pointer and interpret this data to reflect that the mouse pointer has been activated over the trunk region. Instructions would then be run to change the image presented to the buyer so that the trunk is shown as opened instead of closed. Thus, a user could open and close portions of the vehicle to inspect it for damage. Of course, any damaged areas could be indicated as illustrated in Figures 3 and 4 by pointing labels to the damaged areas.

The image map could also be used to identify specific areas of the diagram to be expanded or "zoomed" so that a seller could zoom in on the dashboard, and then see a detailed layout of the parts of the dashboard. With each zoom, a new more detailed diagram and series of labels would be presented to the seller. Thereafter, the seller could zoom in on the radio and be presented with a detailed diagram of the radio. In this manner, the seller could specifically note that a particular button on the radio was not working and that it would cost a specific amount to fix the damage.

In one embodiment, actual photographs of the damages part (e.g.: radio button) could be linked to the vehicle diagram.

It is also anticipated that illustrations of scratches, dents, cracks or tears could overlay the vehicle diagram to show the buyer or seller how the car looks with the damage. Thus, for example, if there was a three-inch scratch on the hood, the seller could select the proper looking scratch from a palette of "scratch' illustrations and indicia and overlay the illustrations on the vehicle diagram.

-1 9One embodiment of the invention is a system for selling vehicles by displaying the vehicle diagrams disclosed herein. This system can be part of an on-line auction, or implemented as a separate system devoted to simply buying and selling vehicles. in embodiments of this system, the seller enters vehicle information, such as the year, make and model of the vehicle for sale. Alternatively, the vehicle identification number can be entered, and the system can automatically parse and store the desired vehicle information. This vehicle information is then stored as a data set to an electronic storage medium. The electronic storage medium can be any conventional computer storage medium, such as a computer memory or hard disk.

Part of the system includes vehicle evaluation data entry terminals that are used by vehicle evaluators to log and store the condition of vehicles being evaluated. In one embodiment, the data entry terminals are conventional personal computers. Once a vehicle evaluator has determined the condition of any part of a vehicle, that information is entered into the vehicle evaluation data entry terminal.

The data from the vehicle evaluator is then saved through the Internet, or conventional on-line data link, to the data set in the vehicle sales system that corresponds to the vehicle being evaluated. Accordingly, the data set thereby includes data on the year, make, model and condition of the vehicle. In one embodiment, the system includes a module, as described in reference to Figure 7, for automatically estimating the cost of repairing any parts of the vehicle that are determined to not be in an "Excellent" condition.

As described extensively herein, a visual vehicle diagram is generated from the vehicle data set in order to visually indicate to a buyer the damaged areas of the vehicle for sale. Examples of these visual vehicle diagrams can be found in Figures 3-4 and 8 As shown in the figures, the vehicle diagrams can include illustrations of the top, bottom or inside of the vehicle.

Buyers that are interested in purchasing a vehicle use their own terminals to access the electronic storage medium of the vehicle sales system and retrieve the vehicle diagram that illustrates which parts of the vehicle are damaged.

This invention may be embodied in other specific forms without departing from the essential characteristics as described herein. The embodiments described above are to be considered in all respects as illustrative only and not restrictive in any manner. The scope of the invention is indicated by the following claims rather than by the foregoing description.

Claims:

1 A computer-implemented system for displaying features of a vehicle, comprising: a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a first memory for storing a rating of the condition of the vehicle part; a first indicator for indicating a first condition of the vehicle part; and a second indicator for indicating a second condition of the vehicle part.

2 The system of Claim 1, wherein the vehicle diagram is selected from the group consisting of: an automobile diagram, a motorcycle diagram, a truck diagram and a motor home diagram.

3 The system of Claim 1, wherein the vehicle part is selected from the group consisting of: a hood, a fender, a window, a stereo, a bumper, a light, a tire, a radio, a frame, a door, a Grill, a seat, a dashboard and a panel.

4 The system of Claim 1, wherein the vehicle diagram is a three dimensional model of a vehicle.

5 The system of Claim 1, further comprising a third indicator for indicating a third condition of the vehicle part.

6 The system of Claim 5, wherein the first condition is "Excellent", the second condition is "Fair" and the third condition is 'Poor'.

7 The system of Claim 1, wherein the first indicator is a first colored label and the second indicator is a second colored label.

8 The system of Claim 7, wherein the first and second colored labels are the same label.

9 The system of Claim 1, wherein the first and second indicators are colored vehicle parts. 1 0. A computer-implemented system for displaying damaged areas of a vehicle, comprising: a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a first memory for storing a rating of the condition of the vehicle part;

a first indicator for indicating a first condition of the vehicle part;a second indicator for indicating a second condition of the vehicle part, and a second memory for storing a value corresponding to the cost of repairing the vehicle part. 1 1. The system of Claim 1 0, wherein the vehicle diagram is a three dimensional model of a vehicle. 1 2. The system of Claim 10, further comprising an on-line module for automatically calculating the value corresponding to the cost of the repair. 1 3. The system of Claim 12, further comprising instructions for parsing a vehicle identification number(VIN) to determine the make and model of the vehicle.

14 The system of Claim 10, further comprising a third indicator for indicating a third condition of the vehicle part. 1 5. The system of Claim 14, wherein the first condition is "Excellent', the second condition is "Fair" and the third condition is "Poor".

1 6. A system for gathering vehicle repair information, comprising:-2 1 a vehicle diagram, comprising an illustration of a vehicle having a vehicle part; a communication interface for transmitting vehicle information to an on-line repair module and receiving a value corresponding to the cost of repairing the vehicle part; and a memory for storing a value corresponding to the cost of repairing the vehicle part. 1 7. The system of Claim 1 6, wherein the vehicle diagram is a three-dimensional diagram of a vehicle. 1 S. The system of Claim 16, wherein the vehicle information comprises the year, make, model and damaged part of the vehicle. 1 9. The system of Claim 16, wherein the vehicle diagram further comprises a field for displaying thevalue corresponding to the cost of repairing the vehicle part.

20 The system of Claim 16, further comprising a first indicator for indicating a first condition of the vehicle part and a second indicator for indicating a second condition of the vehicle part.

21 The system of Claim 20, wherein the first condition is "Excellent" and the third condition is "Poor".

22 A method for displaying special features of a vehicle, comprising:

generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part;storing a first rating of a condition of the vehicle part; andindicating the first rating of the condition of the vehicle part on the vehicle diagram.

23 The method of Claim 22, wherein the vehicle part is selected from the group consisting of: a hood, a fender, a window, a stereo, a bumper, a light, a tire, a radio, a frame, a door, a Grill, a seat, a dashboard and a panel.

24 The method of Claim 22, wherein the vehicle diagram is a three dimensional model of a vehicle.

25 The method of Claim 22, wherein indicating the first rating comprises changing the color of a label that refers to the illustration of the vehicle part.

26 The method of Claim 22, wherein indicating the first rating comprises changing the color of the illustration of the vehicle part.

27 The method of Claim 22, further comprising storing a second rating of a condition of the vehicle part and indicating the second rating on the vehicle diagram.

28 The method of Claim 22, further comprising storing a value corresponding to the cost of repairing the vehicle part.

29 The method of Claim 28, further comprising automatically generating the value corresponding to the cost of repairing the vehicle part.

30 A method for displaying the cost of repairing a part on a vehicle, comprising: generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle part; storing a first rating of a condition of the vehicle part

to a first memory; determining the cost of repairing the vehicle part based on the first rating; and storing the cost of repairing the vehicle part to a second memory. . The method of Claim 30, wherein the vehicle part is selected from the group consisting of: a hood, a fender, a window, a stereo, a bumper, a light, a tire, a radio, a frame, a door, a Grill, a seat, a dashboard and a panel.

32 The method of Claim 30, wherein the vehicle diagram is a three dimensional model of a vehicle.

33 The method of Claim 30, further comprising parsing a vehicle identification number (VIN) for the vehicle to determine the year, make and model number of the vehicle.

34 The method of Claim 33, wherein determining the cost of repairing the vehicle part comprises transmitting the year, make and model of the vehicle to an on-line repair estimation system.

35 A system for displaying the cost of repairing a part on a vehicle, comprising: means for generating a vehicle diagram, wherein the diagram comprises an illustration of a vehicle
I 0 part;means for storing a first rating of a condition of the vehicle part to a first memory; means for determining the cost of repairing the vehicle part based on the first rating; and means for storing the cost of repairing the vehicle part to a second memory.
36 The system of Claim 35, wherein the vehicle part is selected from the group consisting of: a hood, 5 a fender, a window, a stereo, a bumper, a light, a tire, a radio, a frame, a door, a Grill, a seat, a dashboard and a panel.

37 The system of Claim 35, wherein the vehicle diagram is a three dimensional model of a vehicle.

38 The system of Claim 35, further comprising means for parsing a vehicle identification number (VIN) for the vehicle to determine the year, make and model number of the vehicle.

39 The system of Claim 33, wherein the means for determining the cost of repairing the vehicle part comprises means for transmitting the year, make and model of the vehicle to an on-line repair estimation system.

40 A system for displaying special features of a vehicle, comprising:
means for generating a vehicle diagram, wherein the diagram comprises an illustration of a vehiclepart;means for storing a first rating of a condition of the vehicle part; andmeans for indicating the first rating of the condition of the vehicle part on the vehicle diagram.
41 The system of Claim 40, wherein the vehicle part is selected from the group consisting of: a hood, a fender, a window, a stereo, a bumper, a light, a tire, a radio, a frame, a door, a Grill, a seat, a dashboard and a panel.

42 The system of Claim 40, wherein the vehicle diagram is a three dimensional model of a vehicle.

43 The system of Claim 40, wherein the means for indicating the first rating comprises means for changing the color of alabel that refers to the illustration of the vehicle part.

44 The system of Claim 40, wherein the means for indicating the first rating comprises changing the color of the illustration of the vehicle part.

45 The system of Claim 40, further comprising means for storing a second rating of a condition of the vehicle part and means for indicating the second rating on the vehicle diagram. -2 3' . The system of Claim 40, further comprising means for storing a value corresponding to the cost of

repairing the vehicle part.
47 The system of Claim 46, further comprising means for automatically generating the value corresponding to the cost of repairing the vehicle part.

48 A vehicle sales system comprising:
an electronic storage medium storing a plurality of sets of data, each set of data corresponding to a vehiclebeing offered for sale;said storage medium linked to a plurality of vehicle evaluation data entry terminals; each of said plurality of sets of vehicle data including vehicle evaluation data received from one of said I 0 vehicle evaluation data entry terminals wherein said vehicle evaluation data includes the condition of selected parts of the vehicle keyed visually to a vehicle diagram that schematically shows various parts of a vehicle corresponding to the vehicle offered for sale and which is capable of display on a screen; and said storage medium linked to buyer terminals whereby buyers may access and view the vehicle evaluation data in diagram form prior to making a purchase decision. 1 5 49. The system of Claim 48 wherein the vehicle evaluation data includes data keyed to two different vehicle diagrams, one of which is for the exterior condition of the vehicle.
50 The system of claim 48 wherein the storage medium storing the vehicle data sets is part of an electronically networked vehicle auction system.
51 The system of Claim 48, further comprising a module for determining the cost of repairing vehicle parts based on the vehicle evaluation data.
52 The system of Claim 48, wherein the data set includes data that was determined from parsing the vehicle identification number (VIN).

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Private property, economic efficiency, and spectrum policy in the wake of the C block auction

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Abstract:

In the original spectrum auctions of Personal Communications Services, the FCC designated a portion of the spectrum for woman and minority-owned small businesses. The Supreme Court's decision in Adarand v. Pena caused the FCC to redesign the auction with the result that many bidders overvalued this spectrum. Due to this overvaluation, many bidders could not meet their obligations to the FCC. FCC auction history and the FCC's response to the original C block auction are analyzed, and suggestions on fixing these within the given congressional and FCC framework are discussed. It is argued that the best solution would be to treat spectrum like private property.

Text:

(Table Omitted)

(Table Omitted)

But if some of the consequences of his action are outside of the sphere of the benefits he is entitled to reap and of the drawbacks that are put to his debit, he will not bother in his planning about all the effects of his action. He will disregard those benefits which do not increase his own satisfaction and those costs which do not burden him. His conduct will deviate from the line which it would have followed if the laws were better adjusted to the economic objectives of private ownership.

I. INTRODUCTION

The most efficient means of distribution of scarce goods is private ownership. When private ownership is either expressly allowed or

government-use rules closely resemble private property, the good is put to its most highly valued use. Rules of private property are especially necessary when valuation of the commodity is unclear. When the efficiency of private property exists, holders of goods must account for the goods' costs. The failure to create efficient rules by financing outside of private capital markets and the failure to properly institute property rights in spectrum created the current problems with the C block spectrum auctioned off by the Federal Communications Commission (FCC or Commission).

As part of the 1993 Budget Act, the FCC was given the power to use auctions in awarding licenses for spectrum use.2 The original C block spectrum auctions began December 18, 1995, and concluded May 6, 1996.3 The C block auction was for a designated portion of the spectrum called Personal Communications Services (PCS). Personal Communications Services networks provide users with wireless data transmissions, voice transmissions, and electronic mail. Personal Communications Services is expected to offer less expensive services with stronger connections.4

Unlike the previous A and B block auction, reserved and dominated by large bidders such as PrimeCo, Sprint Corporation, and AT&T Corporation, the C block auction was unique because it targeted smaller businesses that, in some cases, outbid large bidders by up to three times the A and B block amount.5 In the short term, the C block auction appeared a resounding success. By offering favorable terms to those companies qualifying under FCC guidelines as a small business, the bidding resulted in a frenzy that drove up auction revenue. By the time the C block auction concluded, the total amount bid for the C block was $10.2 billion.6 This was more than double the revenue of the A and B blocks combined.7 For reasons explained in this Note, the A and B block licensees paid an average price of $16 per person covered in a territory (POP), while C block licensees bid more than $40 per POP for a winning spectrum bid.8

While C block participants bid higher prices for spectrum, big bidders who entered the market first achieved greater economies of scale than newer companies. For instance, it was estimated that Sprint may have a 30 percent cost advantage over smaller companies.9 This advantage is accomplished because a company like Sprint can use national advertising at 50 percent the cost per viewer than a smaller company using local advertising.10 Economies of scale are not the sole problem for small bidders. Even though conditions in the capital markets have been favorable, there was a 70 percent plunge in values of comparable debt and equity issuers.11 Wall Street analysts have estimated the fair market value of the C block at $10 per POP, making it difficult for small bidders to raise the funds needed to build the necessary infrastructure for their networks.12

This led to the current problem. The C block rules required only a 10 percent down payment and then allowed payments to be made over ten years.13 When those payments came due, C block licensees had trouble meeting their obligations. In fact, three bidders filed for Chapter 11 bankruptcy protection. General Wireless, which sought Chapter 11 protection, still owes the FCC over $953.6 million for its PCS licenses,14 Pocket Communications, Inc., which bid $1.4 billion, asked for federal protection in March of 1996,15 and NextWave filed for bankruptcy protection on June 8, 1998.16 This turn of events concerning the C block forced the FCC to offer

a plan for auction winners to return spectrum to the FCC if necessary. This spectrum was reauctioned in March 1999.17

This Note argues that the primary focus of the FCC should be the efficient distribution of property rights in spectrum. Efficiency in this context means spectrum should be placed into the hands of the company or person who values it most. This implies that the only goals of the FCC should be to conduct auctions in an efficient manner and to grant winners an ownership interest equivalent to private property that will be enforced by the FCC.18The C block auction demonstrates the difficulties that are encountered when the FCC deviates from efficiency as a standard.

To properly discuss the relationship between efficiency, the FCC, and spectrum policy, there are several issues that must be raised. First, why did the FCC first move to an auction format to distribute spectrum? Second, what goals was the FCC trying to accomplish by giving advantages to small businesses? Third, what went wrong with the auction, and what attempts have been made to fix it? This Note next suggests ways to fix the C block problem within the given framework. Lastly, what exactly is efficiency, how does it relate to a value-driven policy, and what would an efficient spectrum policy look like? This Note's contention is that the best and most efficient means of distributing the spectrum is an auction where payment is required shortly after the winning bid is selected. Efficiency requires that the highest bidder win the auction and that spectrum rights be transmissible. It is this Note's contention that efficient spectrum policy requires broadening property rights related to spectrum. This would include the right to use the spectrum in whatever manner the owner deems to be in his or her best interest.

II. A BRIEF HISTORY OF FCC DISTRIBUTION OF SPECTRUM 19

A. Comparative Hearings and Lotteries Not all spectrum is available for public use. "Frequencies in the radio spectrum are divided between federal and nonfederal use."Zo While the National Telecommunications and Information Administration (NTIA) allocates and assigns spectrum to federal users, the FCC has the responsibility of managing the nonfederal part of the spectrum.2' For a long period of time, the FCC managed and distributed the spectrum by means of comparative hearings.22 Comparative hearings employed a standard of the "public interest, convenience, or necessity" in granting spectrum licenses.23 The advantage of a comparative hearing was that it gave an applicant a quasi-judicial forum to argue its qualifications for spectrum over competitors.24 However, the hearing also had the drawback of being inefficient. First, no guarantee existed that the competitor who valued the spectrum most would be awarded it. Second, the procedure was costly to administer. For example, original licenses for cellular services were awarded by comparative hearings. Cellular services were in high demand since they were a scarce resource. The FCC received over 200 requests for the first thirty licenses.25 Many of these requests contained over 1,000 pages of documentation and arguments supporting their claims for licensure. The next round of licensing garnered 344 applicants, while the third round attracted 567 applicants.2 The Commission's resources, especially its time, were strained by the daunting task of reviewing and evaluating applications in an equitable manner. Delay was also a problem during the evaluation process. The process could last longer

than two years, causing large opportunity costs. These problems forced the FCC to consider lottery assignments of spectrum as a superior distribution method and to ask Congress for that authority.28 In 1981, section 309(i) was included in the Communications Act.29 The process of a lottery was meant to make the distribution process cost less while also taking less time than comparative hearings.30 The problem with the lottery system adopted by the FCC, however, was that any person or entity could submit an application if it paid the application fee and met minimal requirements.31After applications were submitted, the FCC would select the winner of the license at random. Such a system immediately encouraged speculation by those not interested in creating cellular phone systems. Because the FCC abandoned its application screening process in 1987, almost 400,000 firms claimed to provide spectrum in order to obtain licenses. 32 A significant secondary market emerged from the lottery system used by the FCC. While the initial license almost never went to the entity that valued it most, the absence of anti-trafficking restrictions eventually allowed the market to allocate licenses to the most valued user. This secondary transaction created a large incentive for rent seeking regarding the windfall profits that could be made on a secondary sale.33 The price of an application being low, a large incentive for speculation was reaffirmed. Despite these drawbacks, there is a part of the lottery system that was efficient-eventually licenses went to firms that valued them most. The downside, what made the lottery inefficient, was transaction costs associated with the process. Transaction costs for the year 1991 were estimated to be $190 million.34 The main cost was associated with the time it took the license to be delivered to its highest valued user. On average, this was about two years.35 Since during the delay, the eventual user/customer was denied service, the social cost of the lottery system was quite high. One estimation of social cost for the ten-year delay in licensing of cellular providers was 2 percent of Gross National Product (GNP).36

Both comparative hearings and the lottery system overburdened the ability of the FCC to distribute spectrum efficiently.37 Comparative hearings were wasteful because the amount of effort put into the process was detailed and time consuming. Comparative hearings also failed in the end to give spectrum to the highest valued user. On the other hand, the lottery was inefficient because the time it took to distribute licenses in the secondary market created a large social cost. In addition, the large amount of speculation caused the cost of license application production to rise to nearly $300 million.38 It should be noted that both systems failed to raise revenue for the government. In the lottery system, the profits went to the few speculators who were fortunate enough to win a piece of the spectrum. Comparative hearings failed to raise revenue because the FCC did not receive valuable consideration for the spectrum distributed. B. Auctions In general, the move to an auction format for spectrum distribution has been relatively successful. During the first four years of spectrum auctions, 4,300 licenses were awarded to auction winners who are, or will be, providing service to the public.39 Revenue from the spectrum auctions during that four-year period totaled $23 billion with $12 billion already collected by the U.S. Treasury.40Of the licenses awarded, 53 percent were awarded to small businesses following the tone of 47 U.S.C. 309(j). This success led Congress to extend auction authority until 2007, encompassing more radio spectrum. Most important to the intent of Congress is that

auction costs tend to ward off speculators. Revenue raised by auctions is collected by the Treasury, whereas revenue under a lottery system goes to speculators. Auction winners, those who value the spectrum most, are more likely to implement services quickly. The FCC has broad authority to experiment with bidding techniques to protect the public interest and promote certain objectives of Congress. These objectives include the development and deployment of technology and services in a speedy fashion, diverse spectrum licensees to spur economic development and competition, and recovery of the commercial value of the spectrum for the public.42 Also, a stated objective is the efficient use of spectrum. These goals and objectives are reflected in FCC auction design.

A successful auction of spectrum should result in an efficient distribution of this scarce resource to those who are willing to pay the highest price.43 Of particular importance to the design of FCC spectrum auctions was the allowance for license aggregation and the prevention of collusion in the bidding process.44The nature of the market makes license aggregation a prime consideration for potential bidders. The desirability of license aggregation can be demonstrated by the cellular service needs of the average consumer. When a person is driving in a car throughout a geographical area, he or she does not want to lose service. One solution would be for the cellular user to contract with several providers in an area, but this would entail the high transaction costs of contracting with different providers. The best solution would be for a provider to aggregate service over a given area. Aggregation of licenses can be accomplished by two means. The first is by geographic area.45 A company may wish to purchase many contiguous geographic areas on the same frequency band to offer seamless service to customers. This would also allow a company to pool marketing costs and bargain for band use on the border of a geographic region.46 Second, a firm may wish to aggregate frequency bands within a given geographic area in order to increase the company's bandwidth. By designing an auction encouraging license aggregation, development of new

technologies and services becomes feasible where it would otherwise not be within a limited license framework. Firms developing new technologies or services would not be able to recoup development costs without servicing a broad area. The other general objective of an auction design is to prevent collusion. It is difficult to prevent collusion because bidders need to have information on other participants' bidding behavior.47 Larger amounts of information available to all participants create a more efficient auction because bids are more likely to reflect a participant's actual valuation.48 When various participants obtain more information on a competitor's bidding behavior, the opportunity to collude with other participants increases. This dual-edged sword characterization resulted in the strict FCC rules preventing collusion. Firms that applied for the right to bid for common markets were prohibited from discussing, collaborating, disclosing their bidding strategies, or revealing the substance of their bids.49 The FCC also relied on existing antitrust laws to keep bidders from colluding.5 Auction applicants were required to and still must identify parties with whom they have joint ventures, partnerships, or other agreements.5' Parties are then restricted in communicating bidding strategy to only these firms.52 The primary auction used by the FCC for spectrum distribution is the Simultaneous Multiple-Round Auction.53 The auction's format is as follows: (1) Interdependent spectrum licenses with the

potential for substantial aggregation or substitution are grouped and sold at the same time. (2) All bidders submit bids over a sequence of rounds. (3) At the end of each round, the high bid for each license determines who would be the winner of that license if no higher bids were later received, and also helps fix minimum acceptable bids for the next round. (4) Bidders that fail to submit bids in a round and do not have sufficient standing high bids risk losing eligibility to submit bids in later rounds.

(5) All licenses remain open for bidding until bidding has ceased on all licenses. Before the auction begins, sufficient up-front payments are made for the licenses sought. This form of auction provides more information to bidders about the values of other licenses and allows them to shift their bidding to other licenses.55 The Simultaneous Multiple-Round Auction is only effective if rules are developed to allow withdrawals, stopping, and certain mandatory activity levels. This auction framework has been successful when the ability to pay for the winning bid is established by the participant, but as will be seen by the special designation for the C block auction, it can fail when the FCC allows outside non-economic normative values" to affect its payment program. III. THE FCC'S GOALS IN THE C BLOCK AUCTION The fear exists that a pure auction may not create sufficient opportunities for minority, woman-controlled firms and small businesses. This was the primary concern in creating the C block auction. Congress expressed this concern in section 309(j)(3)(B) of the Communications Act by requiring the FCC to avoid "excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women."ss Congress was concerned that a pure auction might result in an increased concentration of the telecommunications industry with fewer firms, thus reducing competition.59 A. Before Adarand Constructors, Inc. v. Pena Originally therefore, the FCC created special designations for the C block. Bidders were qualified to participate if they had gross revenues not exceeding $125 million in each of the prior two years and total assets of less than $500 million at the time of application.60The FCC also developed special rules for woman and minority-owned businesses. While small businesses that had revenues for each of the past three years could receive a bidding credit of 10 percent.61woman and minority-owned businesses received a bidding credit of 15 percent.62 Businesses that qualified under both categories would receive a 25 percent bidding credit.63 In addition to bidding credits, installment payment plans were instituted by the FCC. If an applicant qualified for the C block auction and bid for licenses in the fifty largest Basic Trading Areas (BTAs), then it could obtain an installment payment plan.. A company also qualified for the installment plan if it had less than $75 million in gross revenues.65 Finally, a special installment method for payment was planned for all women and minority-owned businesses with winning bids. B. Post-Adarand Changes in FCC C Block Policies On June 12, 1995, the Supreme Court decided Adarand Constructors, Inc. v. Pena.67 Adarand significantly impacted the structure of the C block auction. The Court held: "[A]ll racial classifications, imposed by whatever federal, state, or local governmental actor, must be analyzed by a reviewing court under strict scrutiny. In other words, such classifications are constitutional only if they are narrowly tailored measures that further compelling governmental interests."6 This decision was handed down by the Court just three days before the initial short application form for the C

block auction was due.69 The FCC decided to postpone the C block auction until the Commission received input from potential bidders and evaluated what impact the Adarand decision would have on the auction.

Following Adarand, the FCC decided three goals were to be pursued by the Commission. First, additional market competition needed to be introduced by the rapid delivery of wireless services of C block licensees. Second, the FCC wanted to reduce the risk of a future legal challenge to the auction under the new Adarand standard. Lastly, the Commission was concerned with keeping disruption of an applicant's plans to a minimum. Minimal disruption was important because many potential bidders were in the advanced stages of planning when Adarand was announced.70 The FCC opted to define its categories purely in financial terms. Rather than onl

y allowing
minority-owned businesses to receive equity financing, any small business that qualified could obtain equity financing up to 49.9 percent.7' This meant that so long as the applicant, or its control group, controlled 50.1 percent of the applicant's total equity, then the small business applicant could obtain outside financing for the rest of the capital needed to bid for a C block license.72Those applicants who could obtain an installment payment schedule were also specified in financial terms. The FCC created three different financial classifications for potential bidders. All bidders were required to first make a down payment of 10 percent of the company's winning bid.73 The first 5 percent was payable within five business days after the auction closed, and the second 5 percent was payable within five business days after the application was granted.74 If a winning bidder had gross revenues exceeding $75 million in each of the two preceding years, then the winner was to pay both principal and interest over the term of the license. The interest payment at this tier was the "ten-year U.S. Treasury obligations applicable on the date the license was granted, plus 3.5 percent."76 The second tier was for those companies or firms whose gross revenues did not exceed $75 million for each of those two preceding years. The companies that qualified for this second-tier qualification were only responsible for the interest payments during the first year, and then payments included interest and principal amortized over the remaining nine years of the license.78 Interest rates were the same ten-year Treasury obligations, but the additional percentage added to that amount was only 2.5 percent.'9 While these terms were favorable, the most lucrative payment schedule was reserved for those bidders who qualified as small businesses.so A small business for purposes of C block bidding was defined as an entity that, together with any affiliates or ownership interests, had average annual gross revenues of not more than $40 million in any of the three preceding years.8' The installment payments for these small businesses were at the rate of the ten-year Treasury obligation on the date the license was granted. The first six years were to consist only of interest payments, and the last four years were to be amortized interest and principal payments.sz These changes in light of Adarand had consequences that impaired the ability to collect winning bids in the C block auction. C. Goals of the FCC The FCC was forced into a precarious position that caused certain failures in the C block auction. The first failure was an attempt to reconcile two different goals that were contradictory in nature. Congress explicitly wanted the FCC to ensure the diversification of spectrum ownership. To this end, the FCC was to

"disseminat[e] licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women."83 The dissemination of licenses to minority groups and women through the C block auction was frustrated by the Supreme Court's ruling in Adarand, and the FCC decided to modify its auction rules. When the FCC changed its rules to draw distinctions using financial definitions exclusively, it also hoped that these changes would encompass Congress's concerns about minorities and women. The rule change was an attempt to define a nonsuspect group in financial terms, and the FCC hoped this group would significantly correlate with the woman and minority-owned businesses that Congress wanted to aid. The FCC commented on its changed rules by saying: "Although the revised rules do not specifically target minorities and women, we realize that because a large number of minority- or women-owned businesses are small businesses, our new rules will nonetheless, afford designated entities opportunities to participate in the C block auction."84 The FCC recognized that such tracing of groups is incomplete and that some minority and woman-owned businesses would not be able to use the most favorable installment plans available for the C block auction. While some companies would be burdened by the new rules, the Commission believed that other values outweighed those financial burdens. These other values were the need to reduce litigation risks, to increase market competition, and to promote rapid service to the public.86 It should be noted that these were the only goals related to the minority and woman-owned business portion of the congressional mandate. Additionally, Congress stated that the goals of the FCC included promoting the efficient use of the spectrum, promoting economic opportunity, developing new technologies, and recovering the value of the spectrum for the public.87 While the FCC was to consider monetary recovery of the spectrum's value for the public, it was forbidden to use the expectation of auction revenue for the federal government as a "finding of public interest, convenience, and necessity."ss These competing goals are not only difficult to achieve by one federal agency, but both goals may be contradictory and therefore impossible to pursue all at once. For reasons explained later in this Note, the primary goals of the Commission should be efficiency and the establishment of property rights in spectrum. This means putting spectrum in the hands of those who value it most. While this may simultaneously raise revenue for the federal government, efficiency, not revenue maximization should be the first concern of the Commission. IV. WHAT WENT WRONG WITH THE AUCTION AND HOW IT IS BEING FIXED The main problem facing the FCC was that many auction winners expressed concerns with meeting payments to the Commission. In fact, as noted before, three bidders in the C block auction have declared bankruptcy. This created further predicaments when considering how spectrum licenses should be treated in bankruptcy proceedings.89 Are such licenses property interests protected by the bankruptcy law, or do these licenses forfeit back to the FCC, which can then reauction them?9 These are just some of the consequences of the C block auction that should be addressed in any FCC attempt to fix the problem. A. What Went Wrong? The primary problem in the C block auction is two-fold. First, the initial A and B block auction involved participants who were, for the most part, seasoned veterans of the communications industry. This gave those participants a head start for building the infrastructure necessary for any PCS network. They also had substantially more cash and capital resources upon which to rely. This meant that winners of the first two auctions could compete more aggressively on a price basis.

It also meant that they had experience in marketing, advertising, creating a service network, and infrastructure maintenance, which newcomers to the industry (C block licensees) did not have.

The second major problem is that the C block auction drove the values of spectrum licenses higher than their market value. This occurred because small businesses were not able to realize the true up-front costs. Since these types of companies had ten years to pay the cost of the auction at interest rates below market value, sometimes with the aid of bidding credits, it was difficult for a company to estimate what it could afford to bid. Therefore, there was a tendency to overbid. The idea for such lenient terms was that the company would be able to make payments over the tenyear period with profits derived from that license. This estimation of future profits was imperfect. When an economically rational company decided to bid on a C block auction, it first needed to determine what costs it would incur over the life of the license. After that, there existed a need to estimate projected revenues from operations of the PCS license. Using the estimated profits over the next ten years and reducing that amount to its present value, the firm could have determined a rational bid. This rational bid would represent a close market approximation of the value of the license. The problem with this simple formula for valuation of licenses and appropriate bids was the information costs associated with such future projections. It should be remembered that the FCC was encouraging the introduction of small businesses into the PCS market. Since the requirement of a small business was that it have less than $40 million in gross revenue for each of the last three years, and considering the high cost of entry into the communications industry, it can be assumed that many of these small businesses had little experience in determining the valuation of licenses. Therefore, they were unable to determine optimal bids. Even if these small companies were controlled by persons with experience in the industry, PCS was and is a new technology where much is expected and little is certain. Information is highly imperfect in such a situation. It is safe to say that some bidders incorrectly determined the optimum bid.

What seemed to occur instead was a sort of "feeding frenzy." With highly unknown profits ahead, most companies thought of PCS as an unlimited gold mine. Evidence exists that C block participants ignored market-setting valuation comparisons.9' If a small firm with little experience is attempting to evaluate a license, it is rational to predict it would look at previous auctions of similar spectrum. In this case, those would be the A and B block auction. This especially seems the case given A and B block competition was greater with two potential licenses for each market and the participants had "deep corporate pockets."92 The C block auction may have turned into a speculative frenzy because the bidders failed to observe the experience of larger wireless concerns in the A and B block auction.93 This seems to be supported by the fact that the average price per POP in the C block auction was more than triple that in the A and B block auction. Gross speculation concerning the valuation of spectrum was not participated in by all bidders. Two significant bidders, U.S. Airwaves and PersonalConnect Communications, left the auction block when total bidding surpassed the $7 billion mark.4 While U.S. Airwaves planned to create a national presence in the auction by creating alliances with other winners, the company departed the auction because it believed bidding was at an unacceptable level and

the markets to be created were not economically viable. This implies that even considering strong financial backing the licenses in the C block were overvalued.95 95 While some businesses in the C block may have had strong financial backing, general financing may have been another cause of the C block's problems. Most C block bidders failed to arrange adequate financing before the auction took place.9' This is just the opposite of what companies participating in the A and B block auction did. C block bidders believed they would obtain financing before the auction because that financing was readily available to larger concerns like Sprint PCS.97 This was a mistake on the part of the small businesses involved because such previous financing was probably obtained through brand-name leverage. The small businesses involved in the C block auction had little experience, no brand name, and were forced to compete with larger concerns.98 It was error to believe that financing for the start-up of wireless service would easily occur after the auction was completed. B. What Was Done to Fix the Problem? On October 16, 1997, the FCC released an Order giving winners of licenses in the C block auction four options regarding their licenses and payments.99 The first of these options was to continue present payments for the licenses won.'oo Second, one could follow a disaggregation plan.'o' Under this plan, a C block licensee may have surrendered 50 percent of its spectrum to the FCC for reauction.'0 Third, a C block licensee may have given all of its licenses back to the FCC, and then all of its remaining C block license debt would be forgiven.t3 The last option involved paying up front the remaining costs without interest.'4 This allowed the licensee to use 70 percent of its down payment and any new money to pay off the C block licenses won.'5 Any licenses not prepaid would then be forfeited back to the FCC for reauction.'6 There were many other solutions suggested, including changing the amount owed for licenses, which the FCC rejected.'07 It is believed that such changes were not in the public's best interest. Among many policies advocated by the FCC supporting the four-option Order, one included reassuring the integrity of the auction process. Considering those that participated in the auction but did not win, the FCC sought to ensure fairness to all participants in the auction process. This included those who won licenses in other auctions like the A and B block.'9 Another concern of the FCC was not merely to postpone the situation, but to make a decision that resolved the issue in a rapid fashion. Two other policies supported by the FCC were creating certainty in the auction process and promoting economic diversity and competition in the spectrum market.1I Regarding the first option of continuing installment payments, all installment payments for C block PCS licenses were suspended on March 31, 1997, until further notice."' In order to avoid delay, those wishing to continue their installment payment plans were required to begin payment with the Suspension Orders rescission. This occurred on March 31, 1998."2 There was a sixty-day grace period after which licensees who did not submit payments or choose another option were in default.'3 Payments that were to have been made during the suspension period are payable over a two-year period, making one eighth of the suspension period amount due with each quarterly payment.'4 No extensions past the sixty-day grace period were permitted by the FCC."5 The second option, which allowed the surrender of half of a company's spectrum to the FCC for reauction, was designed to disallow winners from benefiting at the FCC's expense. The FCC allowed an entity owning C block spectrum to disaggregate to another C block eligible entity for the first five years following the license. "6 The entity buying the spectrum was and is allowed to make the same installment payments as

the original designated entity." After the five-year period, a company may disaggregate to any non-entrepreneur block licensee so long as the FCC is compensated for unjust enrichment regarding the amount of spectrum.1's When disaggregating half of the spectrum back to the FCC, the C block licensee must have disaggregated half of the spectrum (IS MHz) it has across all BTAs in a Major Trading Area (MTA).m9 The reason for this is simple. The company must disaggregate 50 percent across such a large area to avoid choosing which spectrum is advantageous for it to give back to the government. If a company were allowed to disaggregate whatever amount of spectrum it chose, it could selectively keep the spectrum in the best market or give back the spectrum if it believed the bid price exceeded the market value of the spectrum.*zo

While the FCC reduced the debt owed by half, the government retained the portion of the down payment applicable to the spectrum.'2' All previous installment payments were applied to reduce the amount of interest over the suspension period from March 31, 1997 to March 31, 1998, and were to be made over the first eight payments commencing on March 31, 1998.122 Finally, in order to avoid unjust enrichment, C block licensees electing this option were prohibited from bidding in the subsequent reauction of spectrum disaggregated from the licensee or reacquiring the disaggregated spectrum by a secondary market transaction for a two-year period.123 The amnesty option did not contain as many difficulties as the 50 percent disaggregation plan. Part of this is due to the fact that "cherry picking" of favorable pieces of spectrum was eliminated.24 The amnesty option allowed any C block licensee to surrender all licenses in spectrum for a relief from all payments on that spectrum. This included waiver of any default payments and return of prior installment payments made.' By allowing an amnesty option, the FCC attempted to speed use of C block spectrum to licensees who could afford to implement systems to use the spectrum. Consistent with the implementation goal set by Congress, a company that has built-out a system could keep the spectrum being used and qualify for amnesty for the remaining licenses.126 If a company chose this option, the build-out must have occurred prior to the FCC Second Report and Order in question, and, to avoid cherry-picking, the company must keep all other BTAs within the MTA that has been built-out.127

Because the FCC allows an entity opting for amnesty to bid in any reauction, there must be adequate measures against allowing unjust enrichment. The method chosen by the FCC was to retain the down payment from the original C block auction.'2 By retaining 10 percent of the bid payment (the amount of the initial down payment), an adequate penalty was created to discourage speculation.129 At the same time, the licensee benefits by avoiding default payments and gaining a chance to stay in the spectrum market in the reauction. Since default in this option is avoided, the licensee's creditworthiness is not damaged for application to other federal loan programs.

Under the prepayment option, a C block licensee must have prepaid for a license, and the remaining licenses not paid for must have been surrendered to the FCC.131The licensees who selected prepayment could have used 70 percent of their total down payments made on licenses that they chose to surrender.'32 The licensee may then use any additional "new money" to pay for its licenses under the prepayment option.133By only allowing licensees

to use 70 percent of down payments from surrendered licenses as pre-payment for retained licenses, the FCC hoped that the 30 percent loss would act as a deterrent to excessive bidding in future auctions.'34 To have permitted a C block licensee to use 100 percent of the forfeited license down payment would be unfair to those who lost the auction and to those who continued to pay under the original payment structure.135 A large amount of debate surrounded what amount should be prepaid for a license. There are three possible ways such amounts could have been changed. First, the C block auction bid price could have been reduced to prices paid for comparable A and B block licenses.136Second, the bid price could have remained unchanged, just prepaid.137Third, the price of the winning bid could have been reduced to its present value, and then prepayment would occur.138 The FCC opted for the second possibility and decided to keep the bid price the same under the prepayment option.139 The FCC maintains the reason for this choice was that it was the only method of calculation that was fair to other licensees. "In other words, licensees should pay what they bid."'4 Finally, to avoid selective "cherry picking" of licenses, the FCC limited which licenses could be surrendered.144Again, a C block entity must have prepaid all BTAs within an MTA. The licensee could not just selectively choose which licenses to forfeit while repaying others. An exception to this existed if the licensee did not have sufficient funds to prepay all BTA licenses within the MTA.143 Any licensee must have prepaid for all licenses within an MTA that it could afford, if it had enough money to pay for more than one license, but not all licenses within the MTA. Also, if a firm surrendered a license, it was prohibited from reacquiring that license in a secondary market transaction for two years.TM

The FCC's four options for C block winners have been met with mixed results. According to P

CS Week, the numbers are as follows: "120 licenses in bankruptcy, 144 returned, 119 disaggregated, 87 resuming payments (including 3 for which no election was made and 6 for which defective elections were made), 21 in the hands of the FCC, and 2 which have already been paid off by licensees."'45 The FCC reauctioned spectrum in its hands on March 23, 1999, the largest change being the elimination of installment financing.'46 The FCC retained the previous auction's eligibility parameters,147 sped up the final payment,'48 and created bidding credits for qualified entities.'49 While these are steps in the right direction, they simply provide a patch for the problems faced by Congress and the FCC. It is not this Note's contention that the FCC necessarily caused the problem in the execution of its auction. The rules of the auction were clear and objective. The problem was the policy underlying the rules of the auction, specifically those rules creating special payment plans for small entities. This, combined with the shortsightedness of the bidders, was the major problem of the C block auction. Given the fact that the FCC plans on granting bidding credits to qualified entities, it still ignores the basic conceptual problem. Economic reality dictates that winners be given a property right in spectrum and that auctions reward winners who value the spectrum most.

V. How SHOULD THE C BLOCK AUCTION BE REMEDIED WITHIN THE GIVEN FRAMEWORK?

As a scarce good, the spectrum's distribution will be efficient if two things occur. First, the spectrum should be distributed to those who value

it most. Secondly, from a societal perspective, there should be sufficient competition in the market to ensure accurate prices. However, one thing that must be avoided in this process is a dramatic change in the rules. Companies can only make rational long and short-term decisions when they can count on regulatory law being predictable.[15] If the FCC was to change the rules of the auction or the corresponding payment plans in an ad hoc fashion, significantly deviating from the prior rules, companies involved in future auctions would be frustrated. The uncertainty of FCC changes would have to be projected into current bids, causing further means by which valuations could deviate from the actual market value.

All of this means that when the FCC attempted to correct the problems with the C block winners' ability to pay for their winning bids, the goals of competition and placing spectrum with its most valued user should have been balanced with the need to be consistent with prior rules. This is not to say that when the FCC designs future auctions it should not publicly change the policy and rules it will follow, but that when correcting prior mistakes the word of the issuing agency must be considered good to potential bidders. Within this framework, the FCC should have only either allowed those with winning C block bids to continue their present payment plans or to have prepaid for their licenses at the net present value. Also, companies should have been allowed to sell their spectrum to any entity that can afford to buy it so long as one of the two following options is utilized. When the first option is chosen (paying under the current installment plan), all concerns are taken into account. First, the rules of auction are satisfied. This in some way means a "deal is a deal." Fairness to losing bidders is upheld because the winner is not given favorable treatment. Also, the word of the FCC is not broken. Those participating in future auctions will be able to depend upon the FCC, allowing winners to follow the terms of the auction. This option is not completely efficient, but the partial loss of efficiency is compensated by the informational efficiency (entities can count on the terms of the FCC) created in the future. When a firm keeps its obligations under the current installment payment plan, there is a good chance more competition will enter the market. If the spectrum was allowed to be sold, and the new owner paid under this option, competition would still be enhanced. This means that prices would tend more toward a competitive market because the number of firms is increasing. By allowing the original winner to sell to another party, those entities that could have secured better financing may have gained control of spectrum and would have brought it to the market quickly. This would create a more efficient market by increasing competition and would still closely following the original terms. Unfortunately, there would be some inefficiency because spectrum does not necessarily gravitate toward those who value it most. While those that won the C block bidding, or those willing to buy at that price, will retain the license, others who truly value it more may not have access to ownership. Part of this is due to the exclusion of nonentrepreneurial entities who may have wished to bid more at the original auction. While they may be able to buy the spectrum on the secondary market, there is an inefficiency because time has passed and the license may be less valuable. The buyer may not now be willing to purchase because the spectrum was only valuable before other networks were in place and operating. Another reason that spectrum may not tend to gravitate to those who value it most is the information problems with the auction. If firm A believes a license is worth $100 million and is willing

to pay for it, and firm B believes a license is worth $300 million and is willing to pay for it, then the license will go to firm B. The problem exists when firm B inaccurately estimates the true price of the license and the amount it can afford to pay. For example, assume a particular license is worth $110 million, and because B, a small firm with little experience in the industry that needs money to build the infrastructure, really only has money enough to bid $95 million. The license will go to B but should have gone to the firm that left the auction at $100 million. This demonstrates the problem of normal demand versus effective demand. The license may often go to the firm that demands it more but does not have the resources to make the demand effective. This explains why the installment payment plan may not always efficiently distribute spectrum. Option two would have allowed an entity to pay for spectrum at its net present value or allowed someone to purchase the spectrum from the original winner and pay the FCC in this fashion. This option would have been more efficient than the original installment plan but deviates from the informational efficiency of not changing the rules. The FCC prepayment plan differs in that it does not discount the bid to its present value, but instead makes the company prepay the entire amount of the bid.151The Commission claims that in order to bring credibility and integrity to the rules the amount due under prepayment must be the net high bid.' So, under the FCC proposal, the C block winner would have to prepay the entire principal amount but not the interest due.

There was support for the net present value approach. Representatives Edward J. Markey and W.J. Tauzin asked the FCC in a letter to support a full price buyout where the amount paid would have been the net present value of the net bid prices for the C block spectrum in question.153 This support was well placed. The net present value approach would not have compromised the integrity of the auction rules. First, any licensee would have been allowed to continue with the present system of installment payments. This would satisfy literal compliance with the auction rules. Second, unlike a mortgage where the housing price and the financing arrangement are separate entities, the bids for C block spectrum were different. The companies involved in the auction were bidding on a single thing, paying for a license over ten years at low rates. This was the case because the auction was designed for those entities that could almost never afford to buy a license outside the installment payment system. The bid price not only represents the spectrum but also encompasses the right to not pay up front. By allowing up-front payment, the bid price must be reduced to the licensee's present value, in order to truly represent the present market value of the spectrum.

In connection with efficiency, the "prepayment of net present value" option had a couple of advantages. One advantage was that the FCC would no longer be in the position of a long-term creditor because payment would have occurred immediately. By making the FCC a creditor, an inefficiency resulted because the agency was not equipped to assume that role. One possible solution might have been to sell the creditor's rights of the FCC in the private market. The next large efficiency advantage of prepayment regards an aspect of timing costs. The more delay that exists before new systems of C block spectrum can be built-out, the more barriers to entry increase. This is due to the fact that other providers will have had the advantage of experience, an intact infrastructure, a price advantage, a

market subscribed to its services, and brand recognition. Part of this market advantage would be the fact that existing service contracts may exist for some months into the future creating a high transaction cost to switch services within the contract period. This gives preexisting companies in the market time to react to any new market participant.

Prepayment decreases the time before spectrum goes to market because any company that elected this option must surrender any spectrum for which it could not prepay. Of course the relevant "cherry picking" provisions must be in place, so that in a subsequent reauction the spectrum will have some value to the market. Under the installment plan, it may be several years before an entity realizes it cannot fully pay and must default on some of its licenses. This delay may cause the spectrum to lose its value because of existing competition in the market.

There was also an informational efficiency that would have been created by using the net present value approach. A company would have had immediate access to the true cost of a license and could have compared it with existing market conditions. This would have applied to any entity that attempted to buy the spectrum from the existing C block holder. The buying entity would have been able to judge the market conditions at the time, whether it could make a profit, and whether the bid price is reasonable considering these factors and the economic outlook. The installment plan lacked this advantage because the bid price would have been analyzed over the longer period of ten years, and specific market conditions would become more unpredictable over time. It should be noted, however, that either option created an interest rate risk if the buying entity took out interest loans to prepay for the spectrum. It would consider which rate is more profitable-buying the spectrum up front with a loan or accepting the FCC terms for installment payments.

These two options, the current installment plan by the original terms of the C block auction and a prepayment plan at the bid's net present value within the given framework, should have been given full consideration. Together they would be the best solution obtainable while still remaining true to the original terms and goals of the auction. VI. WHAT EXACTLY IS EFFICIENCY, HOW DOES IT RELATE TO A VALUE-DRIVEN POLICY, AND WHAT WOULD EFFICIENT SPECTRUM POLICY LOOK LIKE? To obtain a better idea of what efficient spectrum policy based on economic principles would look like, it is necessary to understand what efficiency is. Often, the concept of efficiency is compared to value-driven laws or regulations. While some may argue that the criminal law is efficient,'54 most see it as reflecting a different set of values not entirely based on economic concerns. On the other hand, principles in contracts and torts are sometimes solely based on economics. Rationally, it may seem that most law falls somewhere in the middle; that is, some law is based on economic notions of efficiency and property rights, while other areas of law emphasize different protections of an individual's rights. An in-depth discussion of this dichotomy in other areas of law is outside the discussion of this Note, but spectrum policy should be determined upon an efficiency framework, based on objective, economic principles.
A. What is efficiency and how does it relate to the concept of values?

Many consider economic efficiency and morals or values to be two different

methodologies of justifying law, regulation, and policy. It is not uncommon to overhear a proponent of law and economics support a given decision because it is efficient, and then hear an opponent decry the policy because it ignores societal values. This type of categorization is a false dichotomy. Thus, the two categories can be reconciled. It really is the case that efficiency is itself a value that can be chosen to justify a law or policy. Ultimately, the question is what underlying beliefs create a particular value.

Traditionally, efficiency comes from a value system that is utilitarian in nature. A utilitarian believes that societal or individual happiness, wealth, or prosperity should be maximized without regard to who bears the ultimate burden. Utilitarianism itself is a moral theory. It derives from the philosophical theory that morality is a form of hypothetical imperative. This means that if X is a rational goal, and Y will achieve that goal, then Y is the moral action.'55 This demonstrates how efficiency and utilitarianism are ultimately a value or moral judgment. If maximizing happiness or prosperity is a rational goal, as most say it is, then a policy that is efficient (creating the highest level of societal wealth or prosperity) is the moral choice.
Utilitarianism is only one moral system justified by the hypothetical imperative; a more rational argument can be made for a system that utilizes the hypothetical imperative but does not have as its primary goal the maximization of societal wealth and happiness (although these may be byproducts of that system). One of the best arguments for a moral system that favors economic freedom, private property, and the efficiency thus created, rests upon rational human nature. A person's only tool for survival is his mind. In order to survive, an individual must be productive, and this implies using his mind to produce the means of his survival. This requires that an individual be allowed to keep the products of his own labor; essentially government's role is to establish property rights for this end.'56 This results in distribution of goods and services to those who value them most and to those who will put them to their most productive use.

This can be compared to other noneconomic forms of value or moral judgments often used to justify other areas like criminal law. While this Note takes

a contrary position, most believe that other moral goals (such as "thou shall not steal") are not part of a hypothetical imperative. Rather these morals take the form of a duty or rule. There is no justification for murder or stealing; it is wrong every time. One has a duty to obey the rule "thou shall not murder or steal."157 These goals are not the means to an end; they are the end. It is not that efficiency and economics are outside the realm of morals or values, but that different areas of law are often justified by others who use different methodologies.

Rejecting this dichotomy, all areas of law including economic and property law, contracts, torts, and criminal law have a common justification. The law defines when the government can utilize force. This protects individuals because it defines the very limited circumstances in which force may be used in the social sphere. The main difference between areas of law is their focus, and it is not the justification of different areas of law with different methodologies. Economic areas of law seek to protect

ongoing rights in property (usually this applies when no direct intentional use of force has occurred). Areas such as criminal law seek to remedy the violation of an individual's rights by an act of force (physical or nonphysical) that has been employed with some level of culpability.

Goods that are distributed by an efficiency standard are those that traditionally have been classified as economic goods and thus usually fall under property law. Moral goods are definable but lack characteristics common to economic goods. Economic goods are usually material in form because they are easier to measure and quantify for economic reasons. Therefore, peace of mind may be a good that someone is willing to pay for, but usually is not considered under economic analysis because it is so difficult to measure for any modeling purpose. That is one quality of a traditional economic good; it can be measured, and it is usually material. Other attributes are that the good be divisible and transferable. If the good cannot be divided and transferred, then it is difficult for any market to develop for the good. Another quality that is important is that ownership rights be clearly defined and supported. It is very difficult to claim one's own peace of mind, and then transfer it to another.

Since efficiency deals with values surrounding economic goods, it is necessary to focus on what is efficiency. Three areas of efficiency will be considered. The first is that the market correctly values the good in question. This can be called an informational or price valuation efficiency. Second, efficiency concerns the distribution of goods to those who value them most. Under economic theory, valuation is very simple. The person who values a good most is the one who is willing and able to pay the most for it.158Third, and often part of the first area, is that efficient markets for goods are those that are competitive. The reason this overlaps with the first definition is that some may argue that competitive markets are necessary to determine prices accurately.

All of this indicates that a series of steps needs to occur when evaluating a policy, law, or regulation. First, one must ask whether the good is traditionally an economic good. If it is not, then an objective, rational noneconomic value inquiry may proceed. When it is an economic good, economic analysis should be the proper standard. Assuming it is an economic good, the second question to ask is whether the policy is efficient regarding the market for the good and its distribution. This requires a three-part analysis. Does the policy result in the good's price being accurately determined? Next, are those who value the good most receiving it? Lastly, is the market for the good competitive? Spectrum policy needs to meet these criteria.

Efficiency analysis should drive spectrum policy because of the nature of spectrum itself. The qualities of spectrum define it traditionally within the realm of economic goods. While the science is more complicated, it shares many of the same attributes that land does. First, it is divisible. Second, the rights can be transferred. Actually, the spectrum rights alone can be transferred at a minimal price (although the structure needed to use such spectrum is quite expensive). Third, spectrum can be used for multiple purposes, and the nature of the spectrum bandwidth determines the use much like certain land is useful for agriculture or manufacturing. Finally, spectrum can be clearly demarcated, and ownership rights can be asserted.

These qualities of spectrum make it similar to almost all economic goods.

B. What Would an Efficient Spectrum Policy Look Like?

Spectrum generally should be regarded more like property than it is currently. At present, applicants are receiving licenses to provide specific services to the public. This means that those rights

are more like
a land-use permit than fee simple ownership of the spectrum.159 This type of distribution is inefficient because it does not allow several things. First, the spectrum is not necessarily put to its most efficient use. The FCC may have determined what type of service may be provided on a particular band of spectrum, but it is doubtful whether such a use would be as efficient as a profit-maximizing owner. If more profits could be made by using spectrum for PCS than another activity, then PCS will prosper. Spectrum should be put to its most valued use.

It is also the case that some entities that value the spectrum more may be denied its use because their plan of service is not the same as the FCC's plan. This is an inefficient outcome. While the FCC does attempt to assign spectrum to its most efficient use, private valuation will often differ from the FCC's notion of the public interest. The FCC should be relegated to the role of the traffic cop, only preventing owners from interfering with other spectrum users.

1. The Argument for Private Property

Many arguments have been introduced in favor of private property. John Locke argued that since a person has ownership over himself, whatever is removed from the state of nature and then mixed with his labor should be considered his private property.'61 David Hume gave a three-part justification for property rights: human beings seek to improve their lives; people are benevolent toward other people, but not unlimitedly benevolent; and nature has only provided limited provisions for the fulfillment of wants. Hume argues that these reasons make necessary a system of property rules and rights that allow people to follow their own interests and cooperate with other people. 62

This Note contends that the best justification of property rights regarding economic goods (including spectrum) is given by economist George Reisman. Private property is important because it relates to three factors essential to economic production: the profit motive, freedom of competition in the market, and division of labor. The profit motive creates the incentive to expand and improve production. It also balances the proper relative size of industry.163Reisman notes:

The profit motive is what balances the demand and supply of each product and ensures the most rational and efficient distribution of each product over space and time-among all the markets that compete for it-and its delivery into the hands of those individuals who, within the limits of their wealth and income, need or desire it the most.

Private ownership is important in this context because it provides the

superstructure of profit and loss incentives. It is private property that will be gained or lost by the producers of a good. 165 Not only is the incentive for profit and loss important, but private property also ensures that a producer's control over the means of production corresponds to whether the property is used profitably or unprofitably.'66 If an owner is using the means of production profitably, then he is able to save and reinvest those profits, thereby increasing his ownership of the means of production. The owner who is unprofitable will lack funds to maintain or replace the means of production under his control. 167

Also important to economic production is the principle of competition. "If the profit motive is the engine which drives the price system, competition and the freedom of competition are the built-in regulator which provide the essential context in which that engine operates."'6 The right to compete in the marketplace is itself part of the concept of property rights. Freedom of competition is the abilitowners to use the means of production in any industry in which they see fit.'69 Private property in the context of spectrum would allow the owners to truly see the profit and loss derived from ownership of the spectrum. It would also allow them to use the spectrum they own in any capacity they wish.

What makes the free market system productive is division of labor. The concept of division of labor is that production of goods tends to be performed by those who can do it best.170 The importance of the division of labor cannot be underestimated. The process establishes which individuals are best at an occupation, what products will be produced in a given market, and what technology will be employed in production.17 Division of labor is dependent upon the profit motive and economic competition. Competition determines noneconomic decisions of market organizations in a division-of-labor society. "Economic competition is necessary because the most efficient form of organization of a division-of-labor society is not automatically known."'72 As technology, products, and markets change, competition is the most efficient means of incorporating and evaluating the inevitable changes that will occur in the future.

Reisman's analysis applies to all economic goods, including the spectrum. Competition and the profit motive are necessary for the productive use of scarce resources like spectrum. Private ownership of spectrum is necessary to this process. Everyone benefits from the division of labor in society-not just the capitalist, but the population as a whole. Necessary to this division of labor is economic competition and the profit motive. These principles in turn derive from private ownership of the means of production like spectrum.

R.H. Coase in his article, The Federal Communications Commission, also makes a persuasive argument why the most efficient spectrum policy is to define spectrum as property.173 While confusion did reign in early spectrum broadcast use before regulation occurred, the reason is that no property rights were created in the frequencies. In comparing frequency policy to private property, Coase states:

Land, labor, and capital are all scarce, but this, of itself, does not call for government regulation. It is true that some mechanism has to be employed to decide who, out of the many claimants, should be allowed to use

the scarce resource. But the way this is usually done in the American economic system is to employ the price mechanism, and this allocates resources to users without the need for government regulation.

Users would be able to buy the right to use a frequency in the manner in which they see fit with the restriction that they do not interfere with other users. To draw from the property analogy, simply because there are two different uses for a piece of land does not mean that a government agency must assign the proper use of that land. The government only need create sufficient property rights in the land and allow the market to distribute the land to the person who values it most.175

The important thing about property rights is that efficiency is enhanced because there is a reduction in transaction costs. Distribution and rent seeking by parties, either lobbying the FCC outright for licenses in a competitive hearing or for favorable auction rules for their group, is a wasteful use of resources from the view of society as a whole. By creating a one-time auction of spectrum and corresponding property rights, price negotiations can occur that reduce the transaction costs in a change of spectrum distribution. To truly recognize the cost of spectrum, such negotiation and sale of spectrum should also apply to government agencies.'7 Under a Coasian analysis, the aim of the FCC should not strictly be to minimize interference, but through an initial distribution of property rights, to maximize output.'77 Any kind of property right interferes with someone's opportunity to use a resource, but the goal should be that gains from interference offset the costs of that interference.' This analysis means that once the rights of users have been initially determined, the secondary market would best rearrange spectrum to the most valued user. The simplest way to accomplish this is through an auction to the highest bidder and most valued user.17 This in turn brings the analysis of what an auction should look like.

2. Efficient Auctions

For the most part the FCC auctions have been relatively successful in allocating spectrum to the user who values it most. There are two problems with FCC policy. First, the licenses are not treated as property to be distributed by the auction. Secondly, the FCC should not have strayed from the prepayment of licenses in the C block auction. The Simultaneous Ascending Auction (SAA) is very efficient as a means of distribution. Activity rules are put in place to keep bidders from holding back bids and for keeping the auction moving forward at a good pace.'8 The SAA also has advantages over traditional auction techniques such as a sequential auction of licenses or offering all licenses in a single round using sealed bids.181

The reasons for not using these traditional auctions are many. One reason is that there are close substitutes for most licenses, and licenses are complementary. Complementary licenses are important because it means that the individual license is more valuable depending upon whether the user holds licenses for the contiguous area. This means that it is more efficient for some bidders to win licenses within contiguous areas. The SAA form of auction is efficient in this regard because of the simultaneous and ascending features of the auction. The ascending character of bids allows a

bidder to view how his competitors value licenses and for which aggregations those competitors are bidding.[183] The simultaneous feature allows a built-in flexibility for bidders to choose whatever aggregation they seek to win and to change their bid depending upon what others are bidding for that aggregation.[184] This allows a bidder to have better information on what bids it can match unlike a sealed bid auction where bidding is blind.[185]

The FCC is experimenting with combinatorial bidding, which should be implemented if found to increase the efficiency of auction allocation. In short, combinatorial bidding allows an entity to enter a package bid for a group of licenses.[186] The example used by the FCC is to suppose Bidder A places a $100,000 bid for licenses one, two, and four, and Bidder B places a $500,000 bid for licenses two, three, and five. A computer system will then calculate the revenue maximization of the bids and award the highest bids during that round to the respective package.[187] This type of auction is advantageous when strong synergies exist among licenses and preferences by bidders. A corporation such as AT&T may only be able to implement its business plan if it can win a nationwide service area, while a small company may only need local service area licenses.[187] This is one improvement that could and should be made if feasible because it improves efficiency in the auction process. Since this is one area where the FCC has done quite well, it is necessary to consider whether congressional goals for the FCC are efficient.

3. Congressional Goals for the FCC

While the FCC does have some latitude in determining policy for the spectrum, change must occur at the legislative level. Goals that must be evaluated are auctions as a means to raise revenue, provision of incentives to both diversify spectrum and increase competition, and swift distribution of spectrum to create networks quickly. While Congress wanted the FCC to raise revenue for the government, it was not the fundamental goal of the auction process. As long as the spectrum is distributed to its highest user at an affordable cost, society will be better off applying the revenue to the national debt.

One means of increasing revenue is to give bidding credits to force bidders to increase bids to the price at which they value the license. This does not always occur because a winning bid must only beat the second highest bidder, and not necessarily approximate what the winner is willing to pay for it.[89] The main problem with such bidding credits is that there has to be some reasonable approximation of the bidders' valuations. If this could be done, it would be better to just sell the license at the amount valued. Also, to be successful, such credits must have significant restraints on secondary market transactions. Licenses may also go to an entity that values the license less when a bidding credit is given to a small bidder in order to stimulate a large bidder, but the large bidder's valuation is incorrect. The smaller bidder could win the license, and the FCC would have to pay for part of it with the credit amount. Given all the informational problems with predicting valuations, bidding credits to increase revenue should be avoided.

Increasing revenue for the government should not itself be a significant goal. Revenue maximization is not itself efficient. The only thing it accomplishes is redistributing money from the buying entity to the government. Spectrum policy should and has focused upon bringing service to the market quickly and placing spectrum in the hands of those who value it most. Divergence from this goal is unnecessary.

The FCC has also been given the task of increasing diversity and competition in the market for spectrum. First, diversity should not be the primary goal of the FCC. The quest for diversity is what created many of the problems in the C block auction. The primary problem is that under FCC rules, diverse companies were those entities that had little capital or experience in the spectrum market. If an entity values spectrum more, then it is efficient for that entity to receive it. It does not matter whether the owners are entrepreneurs, minorities, or women. When determining the allocation of an economic good, such considerations are irrelevant.

The focus upon competition on the other hand is a little more complex. While it may appear that sufficient competition exists now, it is always possible that in the future more companies need to be in the market to make it competitive. The burden, it would seem, is on the FCC to demonstrate why special terms of financing and special designated blocks of spectrum are needed. What has also not been established is the number of industry participants necessary for adequate competition in the market. These concerns should be addressed before installment payment programs and other measures are used in the future.

There are two main problems with the use of installment payments and special designations for small businesses. First is the assumption that capital markets are inefficient. While the capital market may not be completely efficient, it only needs to be more efficient than the FCC. Since the FCC did not even consider ability to pay, in fact the qualifications used were contrary to ability to pay, the private capital markets would be better at picking companies to equip with financing for an auction. The mistake was to value small and minority business in and of themselves. Instead, private markets would value those businesses (which may include smaller corporations) that had the financial ability to pay, or those businesses with better business plans and forecasts.

The second point is closely related. The FCC should never put itself in the position of creditor. This is especially the case when the companies singled out are smaller concerns. Private lending institutions and capital markets are much better at handling debt arrangement and collection. It will rarely be efficient to determine lending rates outside of the market without tailoring those rates to the individual company. The use of blanket terms of interest and installment payments is absurd because not all winners will be in the same situation. The main point here is that the FCC was not required to conduct itself according to the rigorous standards of a market actor, but in the name of diversity ignored many of the economic realities regarding small businesses. Competition is a worthy goal, and the FCC should encourage many to participate, but there should not be special designations for some entities without a rational reason. The default situation should be a more complete set of property rights for the spectrum.

The last congressional goal given to the FCC is to speed spectrum licenses to the public so that systems are built-out rapidly. This congressional goal is efficient and is another reason why the FCC should not focus on small business and installment payments. The goal of rapid deployment is to bring services to the market quickly. One reason this is so important is to reduce barriers to entry. The longer some businesses have licenses, while other licenses are held up, the greater opportunity prior winners have to gain what may be a difficult, even insurmountable advantage. This is where ability to pay becomes important. Under the definition of a small business used by the FCC, the companies most likely to not have proper financing to build a system will win a license.

Also important for the quick deployment of services is the payment up front for spectrum instead of allowing installment payments. Often, upfront payments force either a prompt payment or prompt default and reauction of spectrum. The up-front payment makes a company obtain financing before the auction so that it can pay the bid price promptly after winning. By allowing installment payments, there is the uncertainty of a company defaulting on its license, and then the delay of reauctioning the license to a user who values it. Also, up-front payments help in the valuation of spectrum because a company must base more of its bid on present conditions. When offered installment payments, not only is the prediction of advanced future revenue required, but a firm must also predict the future capital market's ability to refund future payments to the FCC. Incentives for rapid deployment may in some circumstances be used, but these should not include installment payments.

VII. CONCLUSION

Spectrum allocation by means of an auction has worked well. There are only a few changes that would ensure a more efficient market. The first of these would be to give spectrum the same rights as property and for the FCC to act more like a traffic officer. By giving a property right in auctioned spectrum, there is more development of long-term infrastructure; additional uses and experimentation with spectrum technology are encouraged; and private negotiation of spectrum conflicts or disputes can occur once legal rights are established. These changes, while efficient, are not always advocated because of the fear of monopoly power, but there has been nothing to support these fears.

The C block auction demonstrates how some auctions can go wrong. There are a few things that Congress and the FCC should learn from this. Diversity and competition are not necessarily the same. What the market needs is good competition regardless of whether the company is small, minority, or woman-owned. It is a mistake to assume that monopoly power will occur because many large companies engaged in the bidding. Part of the rationale for encouraging small business ownership is local control and diversification. This ignores the many economies of scale that larger companies will enjoy.

While the FCC needs to fix the current problem, it also needs to remember that companies with imperfect information need to be able to rely on the auction rules. The best way to accomplish this is to allow current payments to resume under the installment plan, or to allow prepayment at the net

present value of the bid. In general, installment payments should not be used in further auctions. The risks of uncertainty are high, and the FCC is not efficient as a creditor because it has no experience in the lending area. If lending is to occur, the FCC must be able to evaluate companies on an individual basis to determine the feasibility of payment plans. In general, the problems that existed within the C block auction were created because too many goals were

given to the FCC, and efficiency was not primary. Although helping small, minority, and woman-owned businesses may be valuable from a moral standpoint, the efficiency of the market should be the primary concern. This means an emphasis on the true valuation of the market value of spectrum, distribution of spectrum to the most valued user, and the ability to create a sufficiently competitive market. It should be noted that spectrum is a scarce economic good just like land and other items treated as property. When one tends to view the spectrum as a public policy experiment, with all the rent seeking that can occur through the legislative and regulatory process, efficiency shifts to the periphery. Efficiency should be the primary goal of congressional and FCC spectrum policy.

Footnote:

1. LuDwiG VON MISEs, HuMAN ACTION: A TREATISE ON ECONOMICS 655 (3d rev. ed., Henry Regnery Co. 1966).
2. 47 U.S.C. 309(j) (1994 & Supp. II 1996).

3. FCC Report to Congress on Spectrum Auctions, Report, 13 F.C.C.R. 9601, 9612 tbl.1 (1997) [hereinafter Spectrum Auction Report]. 4. Mindy Blodgett, It's Time to Pay Up, COMPUrERWORLD, June 3, 1996, at 32.

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5. Jared Sandberg, The Squeeze: Too Many PCS Providers Are Chasing the Same Market, and the Result Isn't Pretty, WALL ST. J., Sept. 11, 1997, at R22.
6. Curt Harler, Heads on the Block, COMM. INT'L, Aug. 1, 1997, at 20. 7. Id.

8. Riva Atlas, Trouble on the C Block: In Its Attempt to Help Out Entrepreneurs, the Government Created a Mess with Wireless Auctions, INSTITUTIONAL INVESTOR, Aug. 1, 1997, at 41.

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9. Sandberg, supra note 5

Footnote:

12. Id
13. Id

Footnote:

15. Bryan Gruley & Quentin Hardy, Wireless Bidders in U.S. Threaten

Default on Debt, ASIAN WALL ST. J., June 27-28, 1997, at 16.

16. Alex Philippidis, NextWave Files Chapter 11 in Wake of Mounting Debt, WESTCHESTER COUNTY Bus. J. (N.Y.), June 22, 1998, at 1. 17. FCC Sets C-Block Reauction for Next March, Whether Bankruptcies Are Resolved or Not, PCS WEEK, Aug. 26, 1998 [hereinafter FCC Sets C-Block Reauction]. 18. The enforcement role of the FCC should be limited to that of the government in most property disputes. This would mean enforcing any use infractions by third parties.

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19. See generally Jonathan Blake, FCC Licensing: From Comparative Hearings to Auctions, 47 FED. CoMM. L.J. 179 (1994). 20. Spectrum Auctions Report, supra note 3, at 9608. 21. Id.

22. Id. This method of distribution of spectrum is codified at 47 U.S.C. 309(a)-(h) (1994 dc Supp. II 1996).
Footnote:

23. FCC Sets C-block reauction, supra note 17

Footnote:

29. 47 U.S.C. 309(i) (1994).

30. Spectrum Auctions Report, supra note 3, at 9609. 31. Christine E. Enemark, Adarand Constructors, Inc. v. Pena: Forcing the Federal Communications Commission into a New Constitutional Regime, 30 COLUM. J.L. & SoC. PROBS. 215, 219 (1997).

32. Spectrum Auctions Report, supra note 3, at 9609.

Footnote:

32. Spectrum Auctions Report, supra note 3

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38. Id.

39. Id. at 9611. 40. Id. at 9603. 41. Id.
42. Id. at 9611.

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43) Id at 9616

Footnote:

50. Id

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57. In this context, the term "normative values" defines those values that some (including the majority of Americans) may think are socially advantageous but are not rational from an economic perspective. The desire to place spectrum in the hands of minority and woman-owned businesses falls into this category. While the FCC, Congress, and the American public may desire these outcomes, they are not economic values. Economic values are primarily concerned with allowing individuals to maximize their own production of goods and services. This Note argues that any company should be allowed to bid for spectrum, and that the company paying the most for it can put it to its best productive use.

Footnote:
58. 47 U.S.C. 3090)(3)(B) (1994).

59. H.R. REP. No. 103-111, at 254-55 (1993), reprinted in 1993 U.S.C.C.A.N. 378, 581-82.

Footnote:

60. 47 C.F.R. 24.709(a)(1) (1998).

61. Implementation of Section 309(j) of the Communications Act-Competitive Bidding, Fifth Report and Order, 9 F.C.C.R. 5532, para. 130, 75 Rad. Reg. 2d (P dc F) 859 (1994).

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62. Id. paras. 133-34. 63. Id. para. 133. 64. Id. para. 137. 65. Id.

66. Id. paras. 139-40.

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67. Adarand, 515 U.S. 200 (1995). 68. Id. at 227.

69. Implementation of Section 309(j) of the Communications Act-Competitive Bidding Amendment of the Comm'n's Cellular PCS Cross-Ownership Rule, Sixth Report and Order, 11 F.C.C.R. 136, para. 4, 78 Rad. Reg. 2d (P & F) 934 (1995) [hereinafter Competitive Bidding Sixth Report and Order].

Footnote:

70. Id. para. 1.

71. 47 C.F.R. 24.709(b)(4)(i) (1998). 72. Id 24.709(b)(6)(i).

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73. Id. 24.711(a)(2).

74. 47 C.F.R. 24.711(a)(2) (1997) (superseded 1998). Current FCC regulations have changed the amounts and timing of payments attributed to the winning bidder's down payment and balance of payments. 75. 47 C.F.R. 24.711(b)(1) (1998).

Footnote:

76. Id.

77. Id. 24.711(b)(2). 78. Id. 79. Id.
80. Id. 24.711(b)(3). 81. Id 24.720(b)(1).

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82. 47 C.F.R. 24.711(b)(3) (1997) (superseded 1998). Current FCC regulations have changed, the result being that the current rate of interest is the ten-year U.S. Treasury obligation rate plus 2.5%. Payments of interest only are for a period of two years, with the payments of interest and principal amortized over eight years.

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83. 47 USC sec (j)(3) (B) (1994)

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88. Id. 309(j)(7)CA)-(B).

89. In the case of General Wireless Inc., bankruptcy protection has produced favorable results. Judge Steven A. Felsenthal ruled that no exchange of reasonably equivalent value occurred, and this fell under the bankruptcy code's definition of "fraudulent conveyance." See Bankruptcy Judge Lowers Value of GWI's Licenses; Outstanding Debt Reduced to $60 Million, PCS WEEK, Apr. 29, 1998 [hereinafter Bankruptcy Judge Lowers Value]. Judge Felsenthal determined the appropriate value of C block licenses by comparing them to F block PCS counterparts. This means that approximately $894 million of debt will be avoided. Id. As of October 9, 1998, the U.S. District Court and the Fifth U.S. Circuit Court of Appeals have turned down the FCC's request to have the ruling stayed. See C-Block Licensee Rises from Chapter 11 Ashes, WIRELESs TODAY, Oct. 9, 1998.

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90. At this time, the FCC will not include C block licenses involved in bankruptcy proceedings to be reauctioned. This will create the need for further auctions as these licenses are reclaimed. Amendment of the Comm'n's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees, Fourth Report and Order, 13 F.C.C.R. 15,743, para. IS, 13 Comm. Reg. (P & F) 220 (1998) [hereinafter Installment Payment Fourth Report and Order].

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91. Bankruptcy Judge Lowers Value, supra note 89 (discussing a bankruptcy court's decision that licenses were overvalued).

92. Marc Cabi, Finding a Resolution for the FCC's C-Block PCS Auction

Debacle, RCR RADIO COMM. REP., Set. 15,1997, at 24.
Footnote:

93. Id.

94. Jason Meyers, Two C Block High Rollers Fold, TELEPHONY, Feb. 26, 1996, at 10.

Footnote:

93. Id

Footnote:

99. Amendment of the Comm'n's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees, Second Report and Order and Further Notice of Proposed Rule Making, 12 F.C.C.R. 16,436, 9 Comm. Reg. (P & F) 1100 (1997) [hereinafter Installment Payment Second Report and Order].

Footnote:

100. Id. para. 6. 101. Id 102. Id. 103. Id. 104. Id. 105. Id. 106. Id.

107. Id. para. 5. 108. Id. para. 2. 109. Id.
110. Id. paras. 2, 4.

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111. Id. para. 23. 112. Id. para. 25. 113. Id.

114. Id. para. 27. 115. Id. para. 30. 116. Id. para. 32. 117. Id.

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118. Id; 47 CFR sec 24.714 (c) (1) (1998)

Footnote:

122. Id.

123. Id. para. 42. 124. Id. para. 56. 125. Id. paras. 53, 58. 126. Id. para. 57. 127. Id.

128. Id. para. 55. 129. Id. 130. Id.

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131. Id Para.64
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144. Id. para. 69.

145. C-Block Restructuring: Official Election Decisions, PCS WEEK, June 24,

1998. 146. FCC Sets C-Block Reauction, supra note 17. 147. Installment Payment Fourth Report and Order, supra note 90, para. 13.

Footnote:

148. Id. para. 35. 149. Id. paras. 45-46.

150. Relating to the issue of predictability, many C block winners are skeptical of staying in the PCS market because the FCC has made the situation too unstable. The CEO of Quantum Communications Group, Inc. noted his disgust with the FCC because the rules

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would change whenever he developed a spectrum strategy. "'I finally got so frustrated because I couldn't make any sound decisions."' Few C-Block Licensees Willing to Stay the Course with the FCC, CoMM. TODAY, June 15, 1998.

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151. Instalment Payment second report and order, supra note 99, para, 66

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154. See generally Richard A . Posner, Economic Analysis of Law 237-70 (5th ed. 1998).

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155. While not believing in its correctness, Immanuel Kant gives an accurate definition of the hypothetical imperative. "The former [hypothetical imperatives] present the practical necessity of a possible action as a means to achieving something else which one desires (or which one may possibly desire) .... The hypothetical imperative, therefore, says only that the action is good to some purpose, possible or actual." KANT SELECTIONS 263 (Lewis White Beck ed., 1988) (quoting from Kant's book Foundations of the Metaphysics of Morals). An excellent example of the hypothetical imperative applied to ethics can be found in the works of Aristotle. See generally 2 THE COMPLETE WORKS OF ARISTOTLE 1729-42 (Jonathan Barnes ed., 1984). In the Nicomachean Ethics, Aristotle correctly argues that all actions aim at some end. The point therefore of ethics is to choose moral ends that reflect excellence. The most excellent of these ends that may be achieved is happiness. "[H]appiness is an activity of soul in accordance with complete excellence ...." Id. at 1741. This goal (happiness) is sought for its own sake, and moral actions are those acts that will achieve happiness.

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156. This argument was primarily advanced by the philosopher and novelist

Ayn Rand. She argued that the economics of property rights is based primarily on the fact that "man has to work and produce in order to support his life. He has to support his life by his own effort and by the guidance of his own mind." AYN RAND, CAPITALISM: THE UNKNOWN IDEAL 18 (1967). To fully support his life, Rand argues, he must be able to dispose of the fruits of his labor. Id.

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157. This value theory represents the philosophy of Immanuel Kant who called this reasoning the categorical imperative. The categorical imperative is derived by the following proposition: "There is, therefore, only one categorical imperative. It is: Act only according to that maxim by which you can at the same time will that it should become a universal law." KANT SELECTIONS, supra note 155, at 268. This means that moral principles are derived by establishing their universal applicability. Unlike the hypothetical imperative, categorically derived moral principles do not seek an end.

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158. Willingness to pay for such a good is only partly correct. One must also be able to effectualize this demand. The concept of effective demand goes back even to the time of Adam Smith, and in essence means that one can sufficiently afford to pay for what one demands. See ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 56 (Modern Library ed., Random House 1965) (1776). This concept arises in Smith's analysis of natural and market prices in Book I, Chapter VII. A person may demand a Rolls Royce, but cannot afford it. That person would lack effective demand for that automobile. So efficiency requires that the good go to the person who values it most, meaning to the person who is willing and able to pay for the good.

Footnote:

159. Kurt A. Wimmer & Lee J. Tiedrich, Competitive Bidding and Personal Communications Services: A New Paradigm for FCC Licensing, 3 COMMLAW CONSPECTUS 17, 19 (1994).

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160. See R.H. Coase, The Federal Communications Commission, 2 J.L. & ECON. 1, 13 (1959).

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161. JOHN LOCKE, Two TREATISES OF GOvERNMENT 128 (Mark Goldie ed., Guernsey Press Co. 1996) (1690).

162. DAviD HUME, A TREATISE OF HUMAN NATURE 536-53 (Ernest Mossner ed., Penguin Books 1985) (1739).

163. GEORGE REISMAN, CAPITALISM: A TREATISE ON ECONOMICS 138 (1996).

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163. George Reisman Capitalism

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168. Id. 169. Id.

170. Id. at 144. 171. Id. 172. Id.

Footnote:

173. Coase, supra note 160. While Coase was only writing about broadcast spectrum, his arguments equally apply to more advanced users of spectrum.

Footnote:

174. Id at 14

Footnote:

180. R. Preston McAfee & John McMillan, Analyzing the Airwaves Auction, 10 J. ECoN. PERSP. 159, 160 (1996).

Footnote:

182. Id

183. Id
Footnote:

187. Id. 188. Id.

189. See generally Ian Ayres & Peter Cramton, Deficit Reduction Through Diversity: How Affirmative Action at the FCC Increased Auction Competition, 48 STAN. L. REV. 761 (1996).

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BIDDER BEHAVIOR AND MARKET OUTCOMES IN TREASURY BILL AUCTIONS (TURKEY)

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This dissertation is an empirical attempt to discover characteristics of bidder behavior in Treasury bill auctions. The dataset we use includes participant-identified bids in 29 discriminatory auctions from Turkey. The complexity of the auction environment, the lack of a firm theoretical framework and the heterogeneity of market participants present a real challenge for a sound analysis of this dataset.

In the first part of the dissertation, reduced form econometric models are estimated to test the implications of the theory on common value first-price sealed-bid auctions, as there does not exist a satisfactory theoretical model of discriminatory Treasury bill auctions. Results suggest that the bidders mark down their bid prices more as the expected dispersion of opinion about the true value of the bill increases, as is the case in the simple analogue of the Treasury bill auctions. It is also the case that as the number of bidders increases in these auctions, increased competition overcomes the considerations of winner's curse, and the bidders mark down their bid prices less if they expect high participation in these auctions. We also show that the Treasury benefits from a policy of revealing any information that will reduce the uncertainty about the true value of the bills, provided that the bidding strategies remain unchanged. The information spillover from the auction to the secondary market is also documented in this part.

In the second part of the dissertation, we adopt an alternative econometric approach to the study of the Treasury bill auctions. The approach is reduced form in the descriptive analysis of the behavior of the agents and is structural in the analysis of the equilibrium implications of these. We break down the complicated decision problem of the bidder into its components and analyze each of the components separately. The main finding from this part of the dissertation is that the dataset can be characterized by the bidders' use of a simple decision rule: Bidders can be described as forming minimum and maximum bid prices based on the result of the previous auction held by the Treasury, then picking a random number of prices in this interval and deciding on the bid quantities. This decision rule, coupled with the Treasury's interest rate targeting policy, performs remarkably well in mimicking both the market outcomes and the bidder-specific statistics.

The last part of the dissertation builds upon the main finding from the previous part. We analyze the performance of a single-bid decision rule for a specific bidder in the simulated data, given the bidding decisions of the remaining bidders. Our results indicate that the single-bid decision rule based on the primary source of public information cannot improve upon the payoffs from the multiple bids generated on the basis of the decision rule "uncovered" in the previous part.

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IDG's PC World Shows How to Win at Online Auctions.
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August Issue Includes 'Savvy Shopper' Guide for Bidding Smart - Before You Put

Your Money Where Your Mouse Is

SAN FRANCISCO, June 28 /PRNewswire/ -- At its worst, the adventure of online auctions can be hair-raising. But at its best, it can be an addictive way to buy high-quality products at bargain-basement prices. In its August 1999 "Savvy Shopper" special report, "Sold! How to Win at Web Auctions," (online now at www.pcworld.com/aug99/auctions and on newsstands July 13) PC World shares insider advice from battle-hardened veterans of big-name auction sites. The article shows prospective buyers how to jump into an auction, what to do once they've won, and how to get the goods -- as well as tips to avoid auction scams. The editors went "a-bidding," armed with a wish list of 20 products, including a computer, a monitor, a CD jukebox, a golf club, a vintage copy of Stephen King's "The Stand," a Mark McGwire rookie card, and a poster for "Star Wars: The Phantom Menace."

The article tests merchant auction sites Egghead Auctions, First Auction, Onsale, and UBid, as well as person-to-person sites Amazon.com Auctions, eBay, and Yahoo Auctions. The editors recommend starting at standouts eBay and Onsale -- "both have scads of items to choose from, well-designed interfaces that simplify buying, and plentiful help and tutorials." But before placing a bid on any site, heed this advice:

* Inspect the item: Give the item listing a thorough going-over -- including the fine print -- to make sure you're buying what you think. Check the sales policies, such as shipping costs (which can add up), refunds, and warranties.

* Price the product: Find out an item's fair market value at price comparison Web sites like Excite's Product Finder (jango.excite.com) and Bidder's Edge (www.biddersedge.com).

* Read the rules: It seems obvious, but you could lose an auction if its closing time changes, and multiple-item sales can get complicated.

* Study the seller: Stick to sellers with a history of honest transactions. All major person-to-person sites rely on a peer review system to encourage fair dealing. Pay with plastic, keep a paper trail, and report

scams to the site. For more tips on safe bidding, see "Don't Get Taken at Web Auctions," in PC World's May 1999 issue (www.pcworld.com/may99/consumer_watch).

A Time-Saving Tip: Many auction services offer automated proxy bidding. Specify the maximum you're willing to spend. The service then monitors the auction, placing bids that are just high enough to beat the current top bid. You drop out of the action only when bidding surpasses your maximum. All the auction sites PC World tested offered bidders a personal page for keeping track of their auctions.

In the final analysis, at Web auctions, there are good deals, so-so deals, a lot of junk, and the occasional bargain of the century. If you're looking to save money and don't mind refurbished or slightly outdated products, merchant auctions are definitely worth a look. And person-to-person sites are impossible to beat for rare collector's items. Check out the full story at www.pcworld.com/aug99/auctions.

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